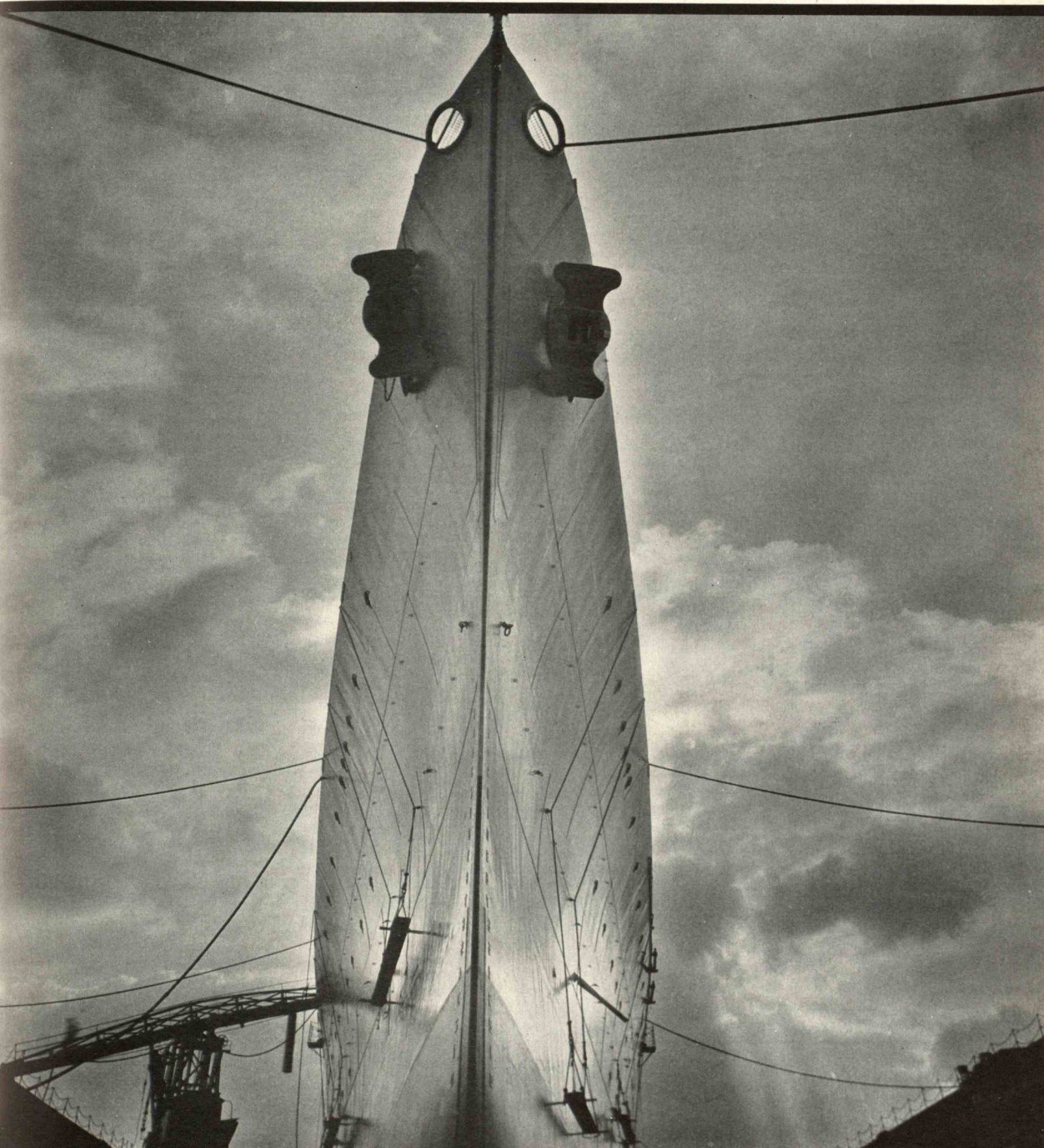


December 1934

TECHNOLOGY REVIEW

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technology review

Published by MIT

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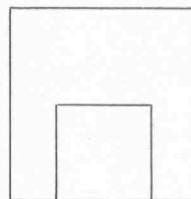
THE TABULAR VIEW

IN presenting his excursion into the by-ways of patent practice in this country, JOHN E. BURCHARD, 2nd, '23, does not offer the study as a definitive piece of statistical research. It represents valid and probably indicative conclusions based on a small amount of recent data and its principal importance is a suggestion for a more extensive, comparative research that might be made by some sociologically minded statistician. As an executive of Bemis Industries, Inc., Mr. Burchard has been in charge of its Patent Department. He has worked on committees of the International Association for the Protection of Industrial Property, American Group, and served at the meetings of the International Chamber of Commerce, Amsterdam, 1929, Washington, 1931, as a member of the American Delegation. This work had to do principally with revision of the International Convention which was to serve ultimately as a basis for further treaties. ❑ HUNTER ROUSE, '29, is a member of the staff of the Civil Engineering Department of Columbia University. Among other articles by him published in The Review have been: "Americanismus," December, 1930; "Engineers as City Planners," February, 1932; "Night Watch at Obernach," December, 1932.

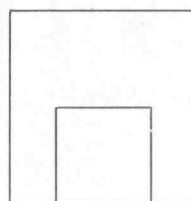
THE Review is indebted to Professor GEORGE R. HARRISON for the description of the spectral analyzing machines presented on page 101, and to DANIEL C. SAYRE, '23, of the staff of *Aviation*, for aid in preparing the article on new developments in American aviation published on page 85. ❑ For permission to reproduce the photograph on the cover of this issue The Review is grateful to *Fortune* and to the photographer, RUSSELL AIKINS who made it for that magazine. ❑ I. N. Zavarine, '20, is Assistant Professor in the Department of Mining and Metallurgy. His beautiful pictures were made with the Edgerton system of high-speed photography.

DO Review readers approve the absence in these pages of wine, beer, and spirit advertising? We solicit comment in the hope that reader reaction may assist us in formulating future policy. Our present policy of exclusion is dictated by these considerations: The Review, as a professional and institutional journal, seeks to maintain unimpeachable standards in both its editorial and advertising columns. It reaches not only a large audience of adults, but a substantial number of pre-college and college students, and it professes an obligation to this younger group. And finally, it carries a variety of advertising — particularly its high-grade technical accounts — which does not, at least it seems to us, mix well with liquor advertising. There is nothing of the blue-stocking attitude in our refusal to open our pages to repeal advertising; we think it is perfectly proper in most magazines. But we still feel, for the reasons enumerated above, that we have been and are on sound ground in rejecting the many hundreds of dollars of liquor advertising offered us.

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Plan View



Front Elevation

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Scale: Full Size

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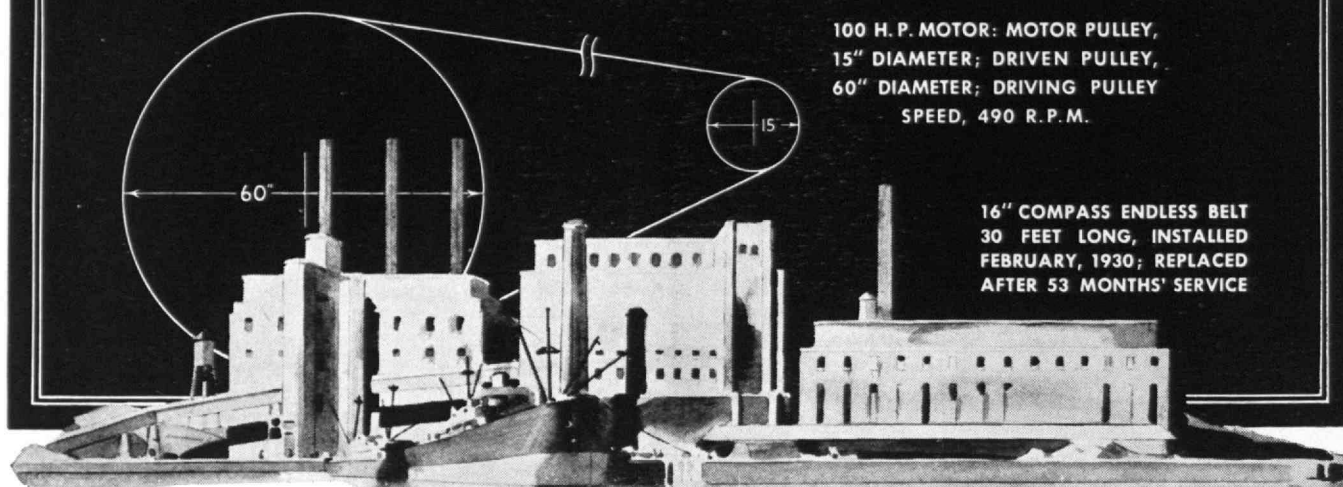
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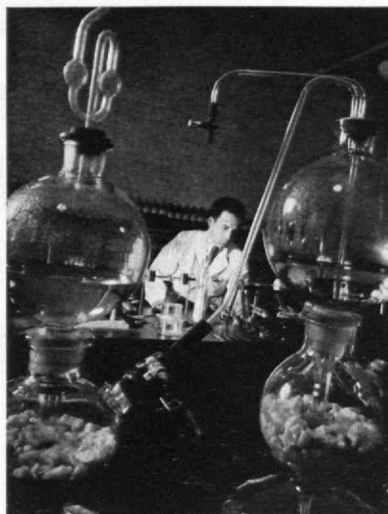
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THE GREATEST NAME

IN RUBBER

GOODYEAR





Merck and Company, Inc.

THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 37, NO. 3

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J. RHYNE KILLIAN, JR.

TENNEY L. DAVIS

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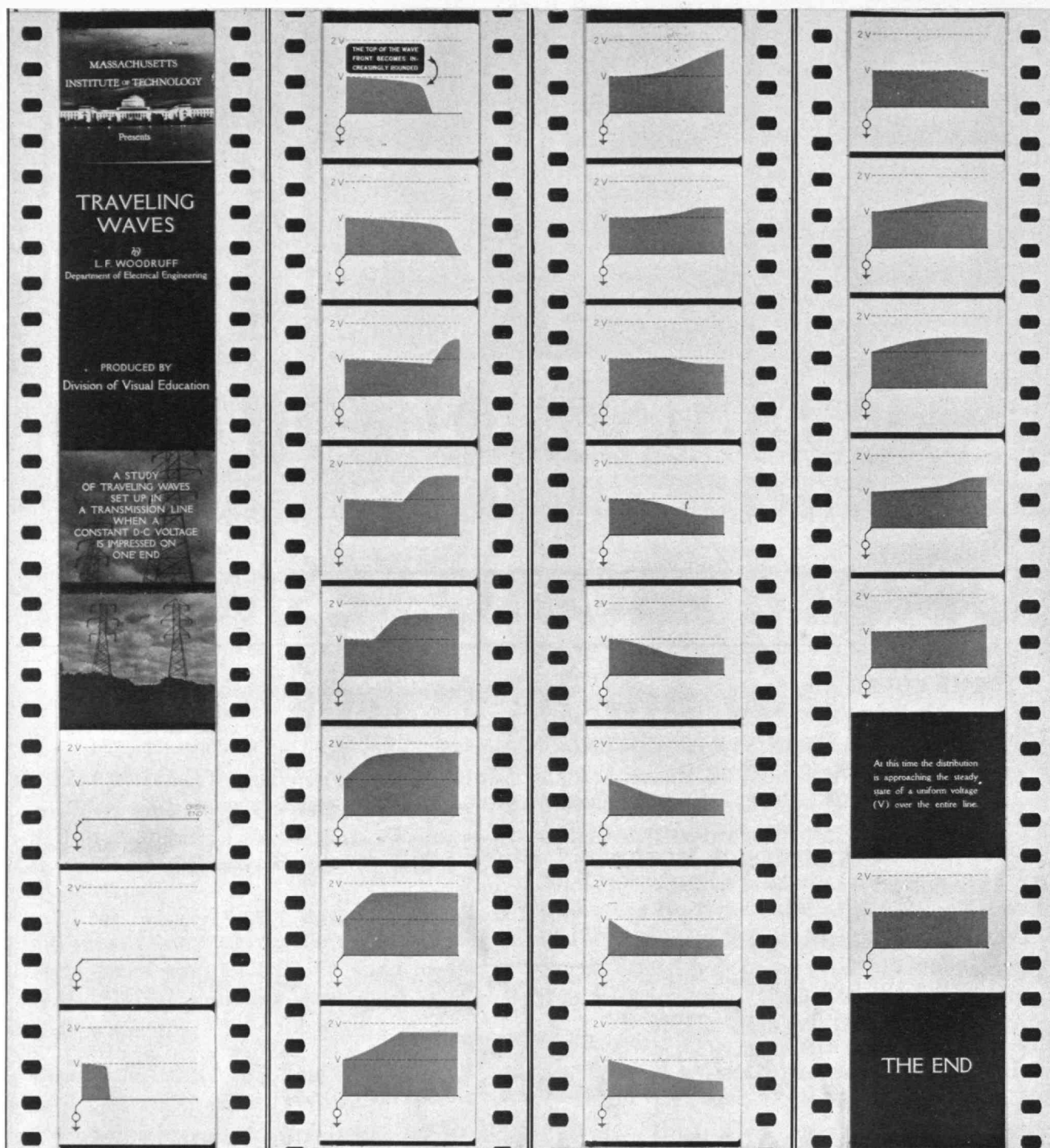
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M.I.T. Photo

Inaugurating a New Program in Visual Education

Above are shown excerpts from the first of a series of motion pictures produced at M.I.T. for instructional purposes. By utilizing the resources of animation technique, these pictures present material difficult to convey in any other way and afford the educator a new and more lucid method of exposition.

The initial film, *Traveling Waves*, shows for the first time the voltage variations which occur when a constant D-C voltage is impressed on one end of a transmission line. The mathematical analysis of the complete effect is so complicated that it has never been worked out, even for the simplest actual conditions. The form and progress of the electrical impulses have, however, been reconstructed by Professor L. F. Woodruff, '18, of the Department of Electrical Engineering, accurately and for the first time, from precise continuous records made at short intervals along the

line which was carrying the impulse. The records were made by a device called a multi-element cathode-ray oscillograph. Many hundreds of these reconstructed forms were carefully prepared and photographed to make possible the throwing on the screen of the actual progress of voltage down a line. The speed of the actual wave, incidentally, is the same as that of light — 186,300 miles per second — but on a 20-foot screen it is slowed down to about one six hundred millionth of this speed.

This new program in visual education was suggested by Treasurer H. S. Ford and is being carried out under the direction of Frank H. Conant of the Institute's Photographic Service. While produced for use in the Institute's own class rooms, these films, covering a variety of scientific and engineering subjects, will ultimately be available to other institutions.

THE TECHNOLOGY REVIEW

Vol. 37, No. 3



December, 1934

The Trend of Affairs

Air Transport Comes of Age

ONE thing above all else is certain about this remarkably unsure year: 1934 is going to be printed in bold face in any future histories of American air transportation. For three separate and excellent reasons will it be so respected: it has been marked as a turning point in governmental regulatory policy; it has seen our domestic airlines increase their average cruising speeds from 120 to 200 miles per hour; and it has brought a new importance to American designers and operators in the rapidly developing field of world-wide air transportation.

The story of governmental gyrations is still being written, either in the spotlight of publicity, pre-arranged or ill-concealed, or behind the scenes in off-the-record pow-wows. The details of our new high-speed domestic services are as widespread as the 90,000 persons who each month travel in the United States by air can scatter them. The rise of American aeronautical importance abroad, with which we are here chiefly concerned, has caused, on the other hand, comparatively little comment, and yet it is the most significant of the year's developments.

RECENT and imminent world air-route progress is something to jolt the imagination of even the

most land bound. Before the middle of this month, it will be possible to mail letters or parcels from any large city in Australia and have them travel with the sun the entire distance by scheduled air routes to any large city in the United States. And, on most of the journey, the addressor may choose between two or three different lines. True, it would cost a good deal for postage, and the missive would travel several times the great circle

distance between the mailing point and destination. But what a trip: Darwin to Singapore, Delhi, Bagdad, Cairo, and Marseilles; then southward across the Mediterranean and Africa to Dakar in Senegal or Bathurst in British Gambia, on over the South Atlantic to Natal in Brazil; northward via Port-of-Spain to Miami. Even at that, depending on the luck of weather and inter-line connections, it might be the quickest mail route between the terminals. Certainly in another 12-month it will be, and by the same token one may by then be able to return an acknowledgment by way of New York, Lisbon, Berlin, Moscow, Irkutsk, Vladivostok, Shanghai, Singapore, Darwin. Or a little later, via Seattle, Fairbanks, Tokio, Shanghai, Darwin.

BUT enough of this speculation so seductive to philatelists specializing in air post stamps and "covers." Right now there are three highly efficient airlines running

BAEDEKER

For this Section

RECORD AIR YEAR Page

The Review, with a bow to our aeronautical industry, charts some remarkable air-mail routes, examines U. S. Aviation's growing eminence abroad, and calls far-flung stations reached by air transport 85

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between Western Europe and Southern Asia: Imperial Airways, *Air France*, and the *Koninklijke Luchtvaart Maatschappij* which considerably stamps its tickets "Royal Dutch Air Lines" and does not resent being called the K.L.M. Their eastern terminals are at the moment Singapore, Saigon, and Batavia, respectively. These three, significantly, have been for a considerable period maintaining scheduled flying services up and down what John Bakeless was pleased to call, in his "Origins of the Next War," the "outline of the British Empire's backbone," to trace which one should draw a

Europe across the North Atlantic; to the trans-Pacific flight of Sir Charles Kingsford-Smith's *Lady Southern Cross*, an American-built Lockheed Altair monoplane with a Pratt and Whitney engine (his *Southern Cross* of 1928 was a Fokker powered by three Wright Whirlwind motors); and to the success of American planes in the London-Australia race. This event, won gallantly by one of the three British-piloted and British-built De Havilland Comets, especially designed for the race, was no minor triumph for American aeronautical skill in that second and third places were captured by two stock



Stock Douglas air liner, of the type flown daily in regular transport across the U. S., which placed second in the London-Australia race. Its performance together with that of the Boeing transport, which placed third, was a triumph for American transport designers. See annexed text

line "... over the Mediterranean, past the Island of Malta, by the sun-baked banks of the Suez Canal, along the torrid length of the Red Sea, out into the Gulf of Aden, through the Indian Ocean to Bombay and Calcutta, and ... a few more hundred miles across the Bay of Bengal and through the Malacca Straits to Singapore. ..."

All three — British, French, and Dutch — plan early extensions southeast, east, or north. Imperial, of course, with the help of *Quantas Empire Airways*, shifts from Singapore beginning December 10, at which time the Duke of Gloucester is due to post Christmas greetings from Brisbane to his royal parents, thus opening regular air-mail service within less than 60 days over the trail blazed in the London-Australia race of last October. Imperial also has an existing, and sizable, feeder for its main line in a trunk route running south from Cairo to Cape Town.

To the north there is the German-Russian line between Berlin and Moscow which has now been extended by the Soviets across Siberia to Vladivostok. To the southwest, French and German services to South America are definitely emerging from the stages of final experimentation and should be on a permanent all-air basis by spring. Finally, there are over 33,401 miles of air routes now being operated in 33 countries by the Pan American Airways system.

The suddenly increased American tinge to the world's air picture is due to the development of our new domestic high-speed equipment coupled with the 59¢ dollar; the launching of the giant Sikorsky S-42 flying boat, or *Brazilian Clipper* (the maiden voyage of which was noted in *The Review* last October), and the other activities of Pan American in China, Alaska, and toward

airplanes of the types being flown daily in regular transport across the United States by TWA and United Air Lines: a Douglas, powered by Wright Cyclones; and a Boeing, powered by Pratt and Whitney's Wasps, respectively. The Douglas, a Dutch entry, flown by two K.L.M. pilots, might have done even better if it had carried more fuel instead of several passengers, their food and baggage, and 30,000 letters.

THERE is every good reason why the domestic American airlines should have pointed the way toward the new higher speeds. They were forced to compete with a highly developed system of ground transportation which was entirely free from the inconveniences imposed by the English Channel and other geographical, as well as political, barriers with which European travel is afflicted. A speed of 120 miles an hour simply did not furnish enough of a speed advantage over our best train schedules to offset the higher costs, the time losses at the terminals, and the uncertainties of weather which penalize air travelers.

There is no theoretical reason, however, for the adoption of the new speeds elsewhere, even in Europe. On the long, intercontinental routes, there is no need even to fly at night when competition with surface transportation alone is considered. Unfortunately for the peace of mind of English and Continental designers, a sharply-roweled spur is supplied by rivalry between airlines of the different countries.

Besides the three paralleling lines to Asia, there are few European capitals not served by from two to four airlines operating under different flags. As long as all flew at 120 miles an hour, or a little slower, European air transport failed to worry about speed, but somebody—

it appears to have been a Swiss, for Lockheed Orions are used on their services to the Balkans — imported a few of the fast American ships and the war was on. The deflated dollar made things that much the merrier.

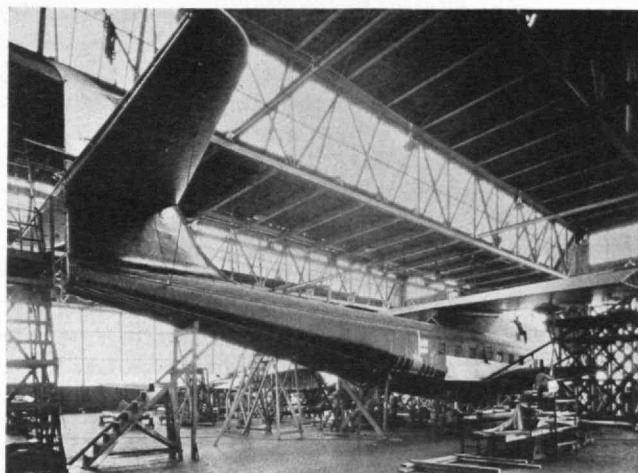
The Swedes purchased a couple of Northrops; the Germans use several Boeing Transports; the Belgian S.A.B.E.N.A. ordered two Douglas ships last September; and the Dutch ordered ten Douglasses after the London-Australia race. For the Dutch also, Anthony Fokker has recently delivered a 16-passenger sleeper-plane powered by four 700-horse power Wright Cyclone engines. These are but a few of the more striking examples. With the increasing shipments of planes and engines go instruments, adjustable pitch propellers, and other subsidiary gear — a nice flow of export goods, but an even more substantial flow of American ideas of aircraft design and operation. It is indeed a phenomenon to have all this happening in a year featured in Washington by so much spectacular testimony about the superiority of European aircraft.

THE launching of the giant Sikorsky and its test flights in which it broke ten world records was as important in the field of flying-boat design as the higher speeds have been for land-planes, with the special significance that here at last is an aircraft which seems really to measure up to the requirements for scheduled service across the North Atlantic.

Pan American's preparations for the future are not limited to the development of aircraft. For years they have been studying routes to Europe and Asia, collecting meteorological data, training crews, developing instruments and special radio equipment. They have operated in Alaska through two arctic winters to gain experience which their South American routes did not provide. They have acquired operating control on the most important of the Chinese airways, over 3,000 miles of routes. Given an extension of their mail contracts, they are ready technically to begin operation of the Bermuda-Azores route to Europe upon the delivery of the two Sikorsky boats still abuilding and the three Martin boats which are to be even bigger than the S-42s. Within two years they could put a first-class airline into Asia via Alaska and their giant boats wouldn't be so bad on the Asiatic run via Hawaii either.



A suggestion for combining utility and aesthetics in the amateur garden: Pear trees as grown en espalier in Normandy



Wide World

Fifty-passenger air liner, America's largest, now being completed in the Martin plant in Baltimore. Designed to fly at a three-mile-a-minute clip, it will enter Pan American service this month

But this discussion begins again to verge on prophecy, and it is still 1934. The ultimate need for the slogan — "Mail, Passengers, and Express Delivered Anywhere Within the Week, or Money Cheerfully Refunded" — to be suitably translated into Esperanto or Basic English, is, however, measurably more pressing than it was in December of 1933.

New Fabrics

WE WERE shown the other day some novel fabrics that will bear watching. One was woven of copper wire and conventional textile fibers, another was crease-proof, and the third was water-repellent.

In the first, copper is inter-spun with silk, cotton, wool, or rayon. This wire-fiber yarn increases the strength of the material in which it is used, prevents shrinkage and stretching, and acts as a conductor for a warming electrical current. The wire, lacquered and insulated, may be woven or knitted, and in the finished material it offers no obstacle to sewing machines, nor does it kink or snarl. No special machinery is necessary for weaving or knitting, and it may be used interchangeably with threads or yarns composed entirely of fibers.

Carpets made of the wire-reinforced yarns are strong and attractive. A flexible cable attached to one corner makes it possible to plug in to any household electrical circuit. Heated over its entire surface to a temperature of 116°, such a carpet quickly warms a room of considerable size.

One of the most interesting applications for this new wire-and-fiber yarn would be its use in airplane wing fabric. It could be heated to prevent formation of ice on wings, and it would be stronger than present airplane cloth.

Other forms in which the new material may appear include upholstery fabrics, curtain cloths, wall coverings, clothing (which might be plugged into automobile electrical circuits), surgical bandages and garments, socks and mittens, blankets, corduroy, poplin, rep, broadcloth, webbings, felts, fire hose, parachute cloth and harness webbing, rope, asbestos cloth, screening and tobacco cloths, acoustical fabrics, automobile robes,

canvas and duck, agricultural cloths, umbrella coverings, and many others. The term "hot pants" may yet become respectable.

Although specially processed copper wire is now employed in these new textiles, wire of other metals, after processing, may also be used.

The process for making fabrics crease-proof was developed in England and is now being applied in this country under license. It is a finishing operation during which a resin is formed in the textile. The process is not applicable to the heavier cloths yet, so wrinkled and baggy trousers will continue to be a pressing problem for the meticulous, but it is useful for cotton and rayon fabrics such as are used for shirts or women's garments.

Various fabrics, including hosiery, dress material, heavy suiting textiles, and others, may now be rendered water-repellent by the application of a colloidal wax. The process is applied in the form of a cold water solution and lasts between washings or cleanings. It may be applied in home laundries or in the various commercial laundry operations without effect upon the fabrics.

Notes and Observations

OF ALL the professional men whose handiwork might be assumed to lend itself to fair critical comment," recently noted Stanley Walker,* City Editor

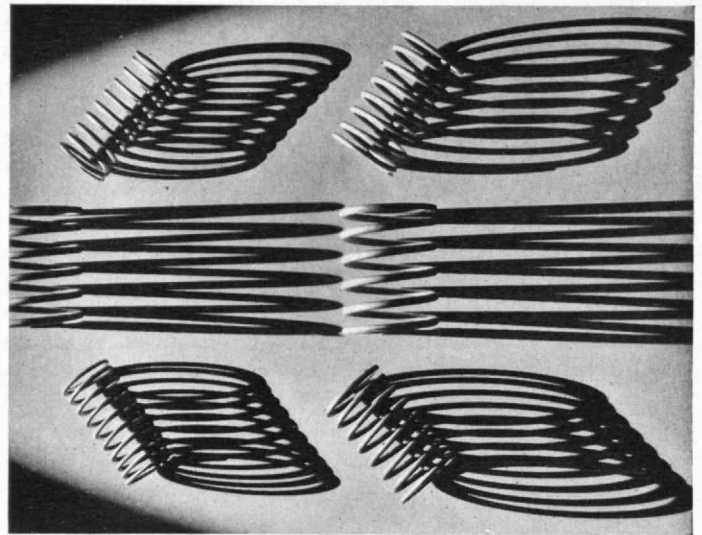
* In "City Editor." New York: Frederick A. Stokes Co. 1931.



Carl Zeiss

THIS IS BRONZE

The beautiful structure of arsenical bronze as revealed by the microscope



Helical springs —

of the New York *Herald-Tribune*, "the architects, in New York at least, are the least able to stand adverse comment. A musician can shrug off a blistering comment on his recital; a sculptor may say, 'Sorry he didn't like it, but what the hell?'" but let a critic print his opinion that a certain building is a monstrosity, and the architect will get his lawyer and go into battle with all the legal weapons from Blackstone to Max D. Steuer.

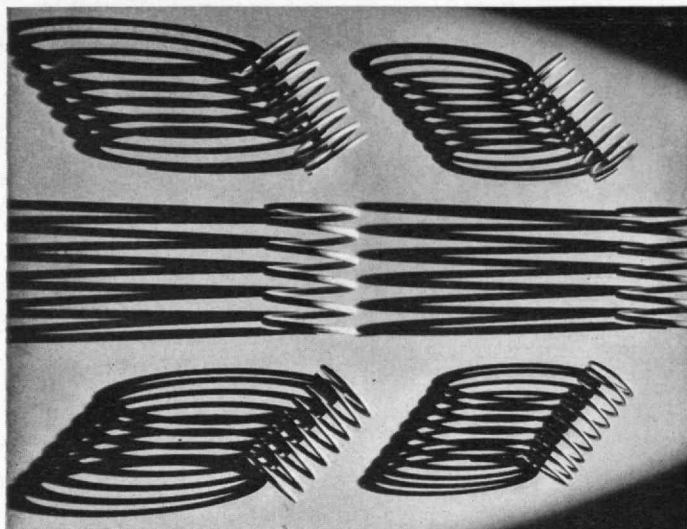
The courts, also, have been surprisingly generous to the offended architects. This situation, it is probable, will not last forever. The architects should learn to stand up under criticism without whining; if they don't, the law some day will be changed to cover their status."

For years *The Review*, along with other journals friendly to the architectural profession, has considered "reviewing" important new buildings, but it has hesitated because of the tender susceptibilities and curious jurisprudence which Mr. Walker describes. It believes that the barriers to sound and fair architectural criticism should be lowered and that if they were, the competent architect would be the chief beneficiary.

TRADITION has it that those who sleep in the moonlight grow weak in the head; they become "looney" or lunatic (from the Latin, *luna*, meaning moon), moonstruck, and mad. Like those "who smoke fuses," they

"Grow weak by slow degrees,
Brainless as chimpanzees,
Meager as lizards,
Plunge, after shocking lives,
Daggers and carving knives,
Into their gizzards."

The alleged results perhaps are not unlike those of looking too long and too persistently on the moonshine. In the case of real moon madness, the results are supposed to be caused by nothing more than the innocent light of the moon. That light, however, is not like ordinary light. It is sunlight reflected from the moon's surface and is largely polarized light — as may be shown by a simple experiment. If, on a



a study in shadows

Lincoln

smooth piece of ground outdoors, the light from the moon be reflected downward by means of a small mirror, reflected in the plane of the moon and of the mirror at right angles to the surface of the earth, there will be a spot of brighter illumination on the ground in front of the observer. If now the mirror be turned in such a way as to cause the spot to trace out the arc of a circle around the observer, it will be seen that the intensity of the illumination becomes less as the direction of the reflection is farther removed from the plane above-mentioned. Moonlight does not permit itself to be reflected equally in all directions.

It is reported that certain fish caught in the Nile spoil overnight if they are allowed to remain in the light of the moon, but that they keep perfectly well in shadow or if covered with a cloth. We are well aware that the moonlight of the Nile Valley is that in which Cleopatra practiced her magic, and it might conceivably differ in other respects from the moonlight of Cambridge and Boston. But we have also made diligent inquiry among men of science qualified to know, and have learned that the fish story has been authenticated by reports in scientific *Zeitschriften* and that it appears to be true. The effect may perhaps be the effect of polarized radiation on fish protein. Who knows but that there may be something in the ancient tale of moon madness after all?

BUSINESS men, once timorously enamored of art in industry as one of the *Finer Things*, are beginning to realize that there is commercial value in industrial design. With their willingness to pay real money to competent designers, comes the problem of how the increasing demand for good designers is to be met.

Shoddy design can no longer be excused on the ground that the public has no taste. The Prince of Wales, according to Geoffrey Holme, once called the billboard "the poor-man's art gallery." That gallery today displays no mean art, an art, most of us would agree, superior to some of the recent prize-winners at Pittsburgh. Moreover, it is to the produc-

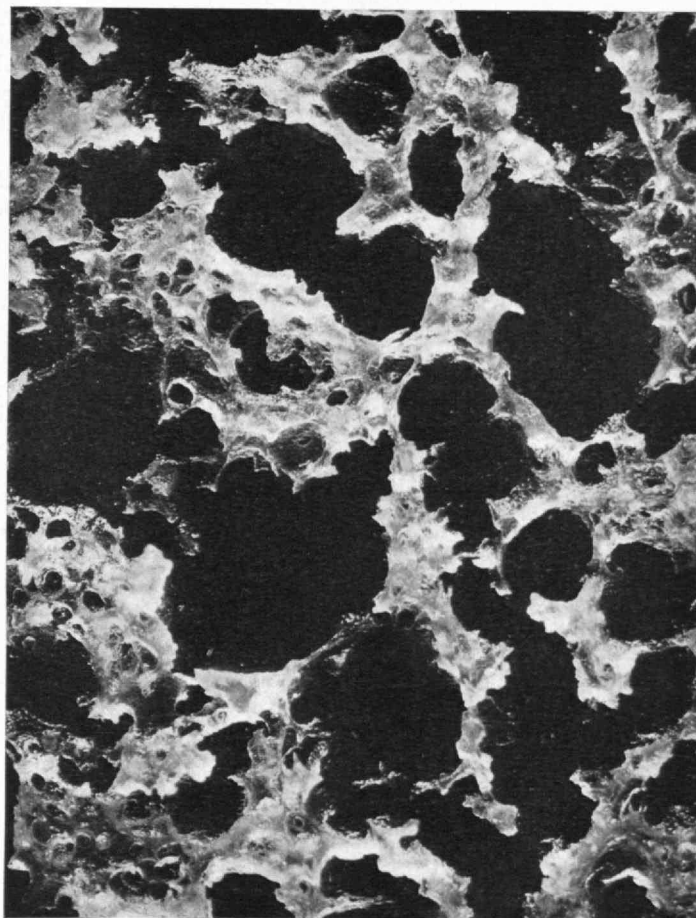
er's advantage to have good design. There is more profit to him in careful attention to the form of a tea-cup to be sold to the millions than in laborious study of a unique cup to be sold to the millionaire.

There is, of course, a good deal of confusion about what industrial design is. The exhibitions and the books about it prove that. The best of them are full of displays that are really not design at all but photography.

A row of oil bottles, beautiful enough in form, arranged on black velvet in a clever formation and knowingly lighted does not advance industrial design. We never see an oil bottle that way outside a museum. By the same token a photograph, however good, of textile bobbins in operation remains art photography and should not be called industrial design.

On the other hand, Jensen's design for Bauer and Black's cardboard carton "cotton-picker," the bomb-rumidor, the Dietzgen plumb bob, the new cosmetic containers, Sinel's suggestion for a new and beautiful petrol pump represent the true field of industrial design, beautification of utilitarian objects with which the man in the street comes into daily contact. Obviously a good designer of such objects must have innate talent, commercial sense, dramatic flair, a fresh point of view, adaptability. These the training can only foster, not create.

But the designer can and must be taught a thorough knowledge of the products with which he is dealing and of the relation of form to material, a cultivated



Shillaber and Lincoln

AND THIS IS CAKE

Photomicrograph of cake section. The cavities were formed, of course, by CO_2



Above and below: *Work of the winds. Snow on Mt. Washington, where fierce winter winds (velocities as high as 231 m.p.h. have been recorded) produce stream-lined snowscapes*

acquaintance with styles, a professional standard of capacity as a draughtsman. Just as a really great architect knows more about building than the builder, so the great designer will know more about the product than the craftsman who makes it.

This education will come from actual work in the plant, from travel, from wide contacts. One of the best backgrounds from presently available educational plants would be provided by a properly oriented training in an architectural or engineering school. The lectures to be given at the Institute (page 103) should be valuable to students interested in design as an art, as should the new course in illuminating engineering (page 103).

NOW, they tell us, government is to devote something over a billion dollars a year for the next five years to the production of low-cost housing for the masses. If this be true, it means that at long last, the small but vociferous group of well-intentioned admirers of the European *Siedlung* have won their way. Three years ago the thought that they would ever get beyond the pamphleteer stage would have seemed fantastic. These people are intelligent and, as a group, include some well-known critics of American housing and observers of European practice. On the theoretical side, they can supply everything that is needed. Unfortunately, few of them are architects or builders, and, as a group, they cannot be said to have the technical training necessary to convert their ideas into buildings.

Unfortunately, too, those architects now pacing the streets and lobbies of Washington, hot on the scent of housing jobs, are, for the most part, men until re-

cently blind to housing as an architectural opportunity. There is small reason to feel they will be the happiest choices for the job of recreating the physical abodes of forgotten men, women, and children.

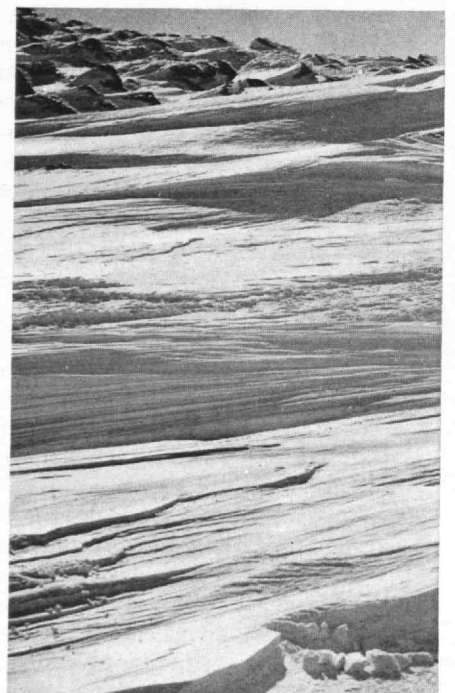
The *Siedlung* group have been having a field day recently in their housing exhibit at the Museum of Modern Art, New York. This exhibit furnished examples sickening enough of Manhattan slum dwellings and photographs stimulating enough of group housing in Amsterdam, Moscow, Vienna, London, Rome. It revealed also what type of room is apparently to replace the rooms of the railroad or dumb-bell apartment. The rooms were Noel Cowardish, no less, with furniture moderne by R. H. Macy.

The rooms prompted Elisabeth Luther Cary to ask a philosophical question worth repeating. Americans, said Miss Cary, are naturally acquisitive. Even in the slums their dwellings have shown that the people living there have wanted to own lots of things. She wonders how magpies like us will react favorably to clean, austere, bright habitations. Viewing the chaos in our own basement and attic, we think we know the answer.

THE American Chemical Society announces that next spring it will celebrate "the 300th anniversary of the establishment of the chemical industries in America." Just what event in 1635 constituted the founding of the chemical industry in this country? Our own private researches reveal an earlier date and indicate that the chemical industries of America grew out of the activities of John Winthrop, son of the second governor of Massachusetts, and who himself became the first governor of Connecticut.

The Winthrops, as Dr. T. L. Davis, '13, wrote in *The Review* of January, 1931, came to this country in 1631. John Winthrop, the younger, alchemist, chemist, and physician, two years later imported chemicals and laboratory equipment from England and became the first manufacturing chemist and practical technologist in the English colonies of North America.

But for the savagery of the Indians of Virginia, a still earlier event might have been referred to as the founding of the American chemical industry, for in 1619 the Virginia Company sent a little group of workers skilled in the manufacture of iron to establish iron works at a location on Falling Creek, near Richmond. Three



of the master workmen soon died and it was not until 1622 that the works, which were designed to consist of a "blast furnace, finery and chafery," began to take tangible form. It has never been determined whether any iron was ever made, for in March, 1622, Indians attacked the plant, killed the workmen, and destroyed whatever buildings they had succeeded in erecting. Iron smelting was not attempted again until the administration of Colonel Alexander Spotswood, who was governor of Virginia from 1710 to 1723.

John Winthrop in 1643 was manufacturing iron at plants in Lynn and Braintree, Mass., and five years later, under commission of the General Court of the colony, he began the manufacture of salt. He was the first man in America to plan a chemical stock company which was to make saltpeter. His enterprises grew rapidly and in 1651 the government of Connecticut gave him a monopoly for the working of tin, lead, copper, antimony, vitriol, alum, and other materials. Later he manufactured glass and in 1662, during a visit to England, Winthrop read a paper on the manufacture of tar in New England before the Royal Society. In addition to his industrial activities, Winthrop became famous as a physician.

But why is 1935 the "300th anniversary of the American chemical industry?"

HORROR mongers are taking full advantage of the open silly season. Basking perhaps in the polarized light of the moon (see above), they insist on describing for us new and dubious horrors calculated to beset civilian populations in the next war.

Whole cities, we are told, are to be bombarded by tremendous loud speakers with the result that women and children will be drowned in a flood of sound. In announcing this new engine of warfare, its proponents failed to point out that immunity to such attacks is rapidly being built up by the hideous outdoor broadcasting long prevalent in our cities.

Close upon the announcement of carnage by sound came a new quirk on the now familiar death ray. A Frenchman, it seems, has devised a death light allegedly powerful enough to injure permanently the retina of the eye. The death light requires a reflector employing a secret metal of the magnesium type which, we understand, is obtainable only in the United States of America.



Orne



Rutase

"Hast thou entered into the treasures of the snow?" (Job 38:22).
Snow is white in the mass because its crystals are mostly transparent and have brilliant facets that reflect light

After being bombarded by sound and blinded by the death light, non-combatants of the next war will then be subjected to that old boggy, bacterial warfare. A French general, after studying these microscopic and sub-microscopic enemies, concludes that while few could be effectively used, these few would be enough in the hands of the ruthless.

It is hardly necessary to emphasize that most of these prophets overlook the fact that there is such a thing as a science of defense and that even if their devices and ideas were sound, there would doubtless be equally sound ways of combating their fatal effects. Back in February, 1929, we pointed out that informed chemists and physiologists generally believe that no poison gas exists at present (nor will one be discovered) against which some means of protection may not be devised.

Notwithstanding, out of the crack pots endlessly rocking will pour new death rays, larger loud speakers, more fatal germs, suggestions of new gases for wiping out whole cities, and horrors yet unimagined. There are always people who seem to read their Buck Rogers too seriously.

SALVAGING sunken ships has grown into quite an industry as we pointed out in October. It has even enlisted the services of Simon Lake, who has designed what might be called a mechanical crustaceon—a 22-foot submarine that can go forward, backward, and sidewise in a water bed. The long tube, stuck like a feeler on its end side, is intended for probing, and can salvage sunken cargoes by suction.

EVEN before Senator Long began to enliven American life, the *Congressional Record* was known by the *cognoscenti* to be an entrancing and amusing human document. Other government publications, less obvious than the diary of the Congress, conceal beneath their drab covers and ugly printing interest of the first order. Of these, surely there is none more full of implications than the *Official Gazette* of the United States Patent Office.

Every week this sober magazine, running these days to about 300 pages, records for its readers with diagrams and copies of typical allowed claims the 800 or so patents the Office has issued during the preceding week. Between the lines of these patents one may follow the course of research in the nation, but more surely the hopes and aspirations of thousands of people who fancy themselves inventors but are doomed to disillusionment.

Executives concerned with patent work for their companies peruse the *Gazette* perforce in order to keep abreast of the work of their competitors. Without serious study, it is perfectly possible for the weekly reader to form certain conclusions as to trends in the patent habits of the nation.

The *Gazette*, for example, confirms an impression that could be formed from knowledge of our present industrial and scientific order. There have been great changes in the art of inventing. If an invention may be said to be an idea formed as a logical deduction from well-ordered data and information, it is quite fair to state that the early inventors of our history were really discoverers rather than inventors. It is no derogation of their accomplishments to affirm that they arrived at their often brilliant results more as a result of inspiration than as a result of logic. Today, with large corporations employing staffs of thoroughly trained scientists, it would be reasonable to expect that the bulk of patents would emanate from the laboratories rather than from the brain cells of some eremitic individual. He would level his lance at a very high windmill who would hope, basing conclusions only on individual and unspecialized information, to make an invention in the fields, for example, of plastics, radio, or aviation. There are a good many Don Quixotes who still besiege the Patent Office, but one would expect a decrease in their number.

The *Gazette* gives a good check on this. Under almost universal corporate policy, patents are issued with the name of the assignee attached. Thus it is possible in every *Gazette* to approximate what proportion of patents have been bespoken by corporate activity prior to their issue. Lately this number has been about 50%.

BUT what of the remaining 50% with its large proportion of gadgets? For years the gadget has been the symbol extraordinary of the old "Yankee inventor," and it occurred to me a short time ago that it would be interesting to find out something about the present state of the Yankee ingenuity business; to find out also whether the course of invention had, like so many other things, taken its way westward.

Prompted by this, I engaged in a very minor piece of statistical research. The results are interesting. They are not based on examination of sufficient evidence to be thoroughly conclusive but they are suggestive.

Yankee Ingenuity—

A Preliminary Inquiry, the Nation's

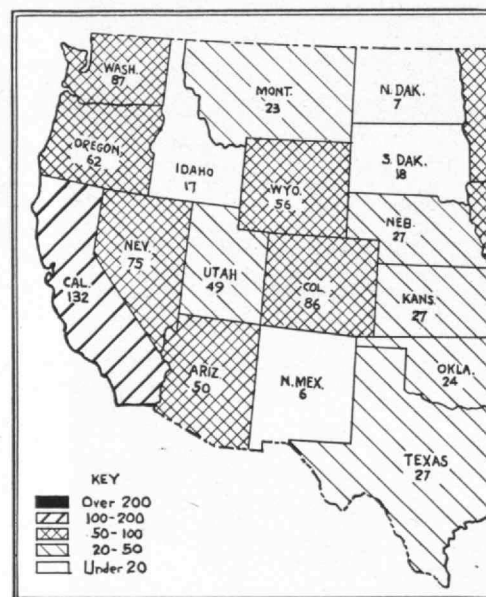
By JOHN E.

By checking the domiciliary state of every patentee published in the *Gazette* over the last quarter-year (about 10,000), it was possible to establish percentages of all patents of the country by states. A division of this percentage by the percentage of population gives an index of invention for each state. Any state with an index of 100 is producing just enough inventions as compared with its population to justify a claim that it does its part in promoting technical progress. Such an analysis, of course, does not show what inventions are useful; that would be almost impossible with the complexity of present industrial technique.

The states were then grouped more or less in accordance with the usual statistical grouping but with slight changes to make them accord more with the industrial arrangement of the country. Thus, Delaware, Maryland, and West Virginia were taken from the South Atlantic States and grouped with the Middle Atlantic. Virginia became part of the South. The rest of the South Atlantic States and those of the East South Central and West South Central except Texas and Oklahoma were combined as South. East North Central and West North Central were called "Industrial West" and "Agrarian West," respectively.

The indices for the individual states as well as for the regions appear in Table I. The first thing of interest that appears in this table is the large percentage of United States patents issued to foreigners or people who live extra-territorially. By far the majority of these were to Germans or Englishmen. The inventions made by residents of the District of Columbia or the United States territories were negligible.

Turning, then, to the sections, it appears that New England still is the leader with an index of 134, but is run to a virtual tie by the Industrial West



See Table,

Is It Going West?

Strictly Pleasurable, into Patent Habits

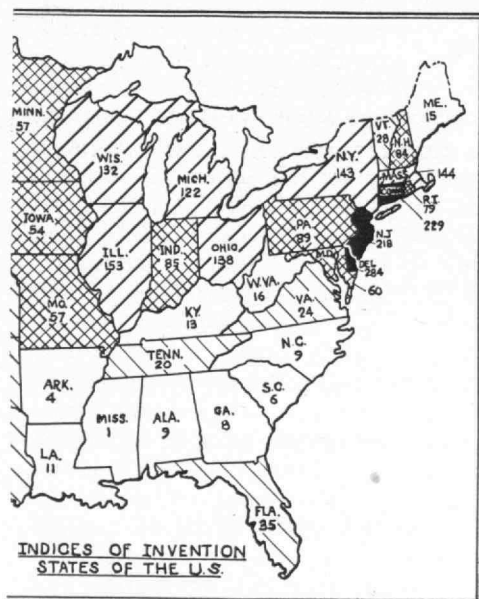
BURCHARD, 2ND

with 133. The Middle Atlantic and Pacific regions also stand high. The Agrarian West and the Mountain regions contribute perhaps all that could be expected, considering the life pattern of their peoples, with indices of 44 and 48, respectively. The Texas region does not live up to expectations, with an index of 26, while the technical sterility of the South is once more demonstrated by the very low index of 12. Of the Southern States, only Virginia and Tennessee show any inventive aptitude at all, with indices of 20 or better, while Bilbonian Mississippi turns up with a glorious index of one.

Naturally one expects the bulk of inventions to be made in industrial areas and forgives small indices in agrarian regions. But the South has, after all, made industrial strides and this index seems to show all too clearly that the life blood of that industry is still northern; that the South has not yet recovered at least in the field of invention from a state of mind implanted by its ante bellum economic theories.

Of individual states, ten have indices better than normal. They are, in order: Delaware, 284; Connecticut, 229; New Jersey, 218; Illinois, 153; Massachusetts, 144; New York, 143; Indiana, 138; Wisconsin, 132; California, 132; Michigan, 122. Delaware owes its high index unquestionably to its small population and the location there of E. I. duPont de Nemours and Company, a corporation with an aggressive patent policy. Connecticut, also small, has a very high degree of industrialization.

New Jersey, with a population of some consequence, seems to be the real leader, everything considered, far ahead of Illinois, Massachusetts, and New York. Other states in the Mississippi class are Maine (15), North Dakota (7), New Mexico (6), and nearly all of the South.



Of the ten leaders, California is the least obviously industrial. Its high rating, coupled with known facts as to its population and its habits of thought, suggested that perhaps this was the state that had become the home of the erstwhile "Yankee inventor." It was possible to check this in two ways: first, by analysis of the percentage of corporation assignments, and, secondly, by analysis of the type of patents issued.

Corporate assignments are a good guide because, although corporations have often been guilty of misguided and extravagant patent programs, any invention which a company sends to patent has at least had some criticism from specialists. In contrast, the individual usually furnishes his own funds for promotion of the uncriticized idea, or borrows them from friend or uncle.

Analysis indicated that in California corporate assignments of the patents examined were remarkably low. Although the average for the country was close to 50%, only 25% of the patents issued to Californians had been assigned to corporations at the time of issue. This should be contrasted with 50% in New York, 55% in Illinois, 70% in Massachusetts, and 75% in New Jersey.

Moreover, the inventions of the other leaders were dominated by patents in fields of industry associated with the state. California's were not. By inspection it was easy to see a preponderance of electrical inventions in New York, of shoe machinery and textile equipment in Massachusetts, of chemical in New Jersey, automobile in Michigan. In California, on the other hand, but 27% of the inventions could be said to be related to Californian industry on the broadest possible interpretation, while another 27% were gadgets. The gadget, it will be remembered, was the gonfalon of the Yankee inventor. A classification of 300 Californian inventions appears in Table II.

Gadgets cover a wide variety of things. Among those noted as emanating from California were: ironing boards, incense burners, nether garments, necktie racks, lamp-shade holders, tobacco pipes (always a favorite), safety razors, electric alarm clocks, potato planters, anti-burglar locks, body vibrators, and eye cups.

Now it is in the gadget field that one expects to find the Quixotic inventions. There are, of course, many things that will not work in other fields. Individuals with no technical knowledge have no hesitation in designing and patenting pontoon docks for the use of trans-oceanic planes, asphalt emulsions, radios, gyroscopes. But only the expert in the field can detect the flaws in these. The flaw in a gadget is obvious even to the inexpert.

The prime "nut" inventions deal, of course, with perpetual motion. In Great Britain the Patent Office takes the position that an applicant for a patent on perpetual motion is crazy, and grants him a patent forthwith on the assumption that the patent can do no harm and the Exchequer might as well have the fee. The United States Patent Office, on the other hand, writes the applicant a letter, giving him the opportunity to withdraw his application and have his fee returned or else have a final rejection at once based on the law of conservation of energy. If physicists some day modify this law, the position of our Patent Office will be embarrassing, to say the least.

To British practice, therefore, may be attributed the fact that in the British Patent Office repose more fantastic inventions than can be found in Washington. These include a gun which will fire round bullets at Christians and square ones at pagans, a phonograph record made of toffee so that, when the music palls, the records can be eaten, and a method of getting around the world in a hurry by ascending in a balloon and waiting 12 hours while the earth turns around beneath.

A classic in the American Office is the machine to be attached to the hen for the purpose of automatically dating the egg precisely at the moment of laying.

TABLE I

INDICES OF INVENTION FOR STATES AND SECTIONS OF THE UNITED STATES

	% Patents	% Population	Index
NEW ENGLAND.....	8.92	6.65	134
Maine.....	0.10	0.65	15
New Hampshire.....	0.32	0.38	84
Vermont.....	0.08	0.29	28
Massachusetts.....	4.98	3.46	144
Rhode Island.....	0.44	0.56	79
Connecticut.....	3.00	1.31	229
MIDDLE ATLANTIC.....	30.30	24.32	125
New York.....	14.60	10.25	143
New Jersey.....	7.16	3.29	218
Pennsylvania.....	6.98	7.85	89
Delaware.....	0.54	0.19	284
Maryland.....	0.80	1.33	60
West Virginia.....	0.22	1.41	16
INDUSTRIAL WEST.....	27.26	20.60	133
Ohio.....	7.50	5.41	138
Indiana.....	2.24	2.64	85
Illinois.....	9.54	6.22	153
Michigan.....	4.82	3.94	122
Wisconsin.....	3.16	2.39	132
AGRARIAN WEST.....	4.82	10.83	44
Minnesota.....	1.20	2.09	57
Iowa.....	1.03	2.01	54
Missouri.....	1.68	2.96	57
North Dakota.....	0.04	0.56	7
South Dakota.....	0.10	0.56	18
Nebraska.....	0.30	1.12	27
Kansas.....	0.42	1.53	28
MOUNTAIN.....	1.44	3.02	48
Montana.....	0.10	0.44	23
Idaho.....	0.06	0.36	17
Wyoming.....	0.10	0.18	56
Utah.....	0.20	0.41	49
Nevada.....	0.06	0.03	75
Colorado.....	0.72	0.84	86
New Mexico.....	0.02	0.35	6
Arizona.....	0.18	0.36	50
PACIFIC.....	7.70	6.67	115
Washington.....	1.10	1.27	87
Oregon.....	0.48	0.78	62
California.....	6.12	4.62	132
SOUTH.....	2.56	20.81	12
Virginia.....	0.48	1.97	24
Kentucky.....	0.28	2.13	13
North Carolina.....	0.22	2.58	9
Tennessee.....	0.42	2.13	20
South Carolina.....	0.08	1.41	6
Georgia.....	0.20	2.37	8
Alabama.....	0.20	2.16	9
Mississippi.....	0.02	1.64	1
Arkansas.....	0.06	1.51	4
Louisiana.....	0.18	1.71	11
Florida.....	0.42	1.20	35
TEXAS.....	1.76	6.70	26
Texas.....	1.30	4.75	27
Oklahoma.....	0.46	1.95	24
EXTRA-TERRITORIAL.....	15.24	0.40	

Knowing the intellectual temper of California, as indicated by such phenomena as Utopia, Townsend, Sinclair, and Aimee McPherson, and coupling with that the number of gadgets emanating from that state, it seemed reasonable to expect that California might be furnishing most of the diversion of the Patent Office. So far as my researches go in the modern field, California is, however, found not guilty.

In fact, no state can claim a monopoly. Thus from New York comes a device for stopping skidding. When the automobile goes into a side slip, one depresses a pedal and a huge arm with teeth descends from the chassis firmly to be pushed into the road surface as an anchor. Ohio contributes a key which automatically pops back into your hand after it has done its work. Illinois offers a combined lamp and insect trap. The light attracts the bugs which flit into a trap above; the trap when full is dumped outdoors. Minnesota presents a combination shirt and suit coat, further to plague garment makers already complaining because men are leaving off their undershirts.

California, of course, does not fail us altogether. Drivers will be benefited by a little bird projecting above the radiator cap which, by the position of its wings, tells him unerringly which direction his front wheels are canted; children can brush their teeth correctly with a motor-driven oscillating toothbrush; lazy golfers will like an automatic tee ejector attached to their bag. From Pennsylvania, however, comes the invention best in tune with the times. The Keystone State offers a unique shovel. To the handle of the shovel is pivoted a seat. The shovel is leaned against a convenient wall or tree, the seat turned down and — *voilà*. The inventor, one assumes, anticipates a wide sale to the ERA administration.

Such results of the fantastic tremors of the human brain may add considerably to the merriment of a nation. They ought, moreover, to serve as casual entertainment for some unemployed statistician who could give time to a thorough analysis along the lines indicated above. There must be at least one such man this side of Washington.

TABLE II

ANALYSIS OF 300 RECENT CALIFORNIA PATENTS

In Industries Peculiar to California.....	81	27%
Fruit.....	18	
Packing.....	24	
Mining.....	36	
Cinema.....	3	
In Industries of, But Not Peculiar to, California.....	86	29%
Construction.....	33	
Machines.....	24	
Advertising.....	21	
Dispensing.....	6	
Restaurant.....	2	
In Industries More Typical of Other Sections.....	52	17%
Motor.....	19	
Heating.....	15	
Chemical.....	9	
Shipbuilding.....	3	
Aviation.....	3	
Railway.....	3	
Gadgets.....	81	27%

Whirling Enemies of Motion

*Containing Reflections on the Root of the
Resistance Evil, and an Explanation of
the How's and Why's of Streamlining*

BY HUNTER ROUSE

Illustrations by the Author

WHETHER or not we are all in hearty accord with the æsthetic tastes of modern automobile designers, we must admit that there is more behind the present trend toward the streamlined vehicle than a desire to boost consumption. We are fully aware of the sense of speed that is given by the beautiful lines of a racing yacht, or by the trimness of modern aircraft, but few of us can explain to our own satisfaction just why prolonging the stern of a car or softening the curves of a locomotive could simultaneously promote speed and cut fuel costs. Just what is this foe to motion whose only apparent fear is trimness and beauty of lines?

The first clear answer to the how's and the why's of this problem came from a professor in the little German university town of Göttingen at just about the time that the infant profession of aeronautics had reached the age of insatiable curiosity — that dreaded stage when fathers must have a ready explanation for the most perplexing of life's mysteries. But this professor proved most satisfactorily his parental alertness by recognizing in a modern puzzle a phenomenon as old as the science of hydro-mechanics: that mathematical complexity called the vortex. Not only did he recognize the identity between the actual and the theoretical, but he did much toward making the rôle of the vortex the focal point of study throughout the scientific world.

Had any of those Eighteenth or Nineteenth Century mathematicians pulled an oar in a varsity shell, classical hydromechanics might not have been so final in its rigid proof that a vortex may neither be started nor stopped; for absent-minded indeed must a crew man be to fail to notice the violently whirling depression he forms in the water surface at every stroke of his blade. Yet even had these theoreticians experienced the patience-trying ordeal of trailing behind an old Model-T on a dusty road, the turbulent wake of brown cloud would scarcely have suggested any relationship with their conception of a body's motion through a perfect fluid.

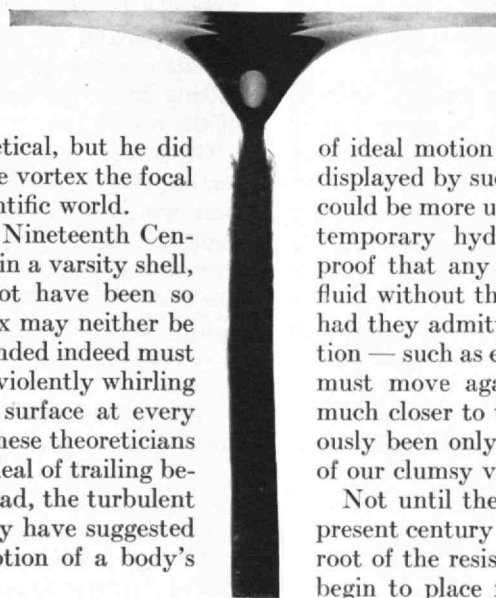


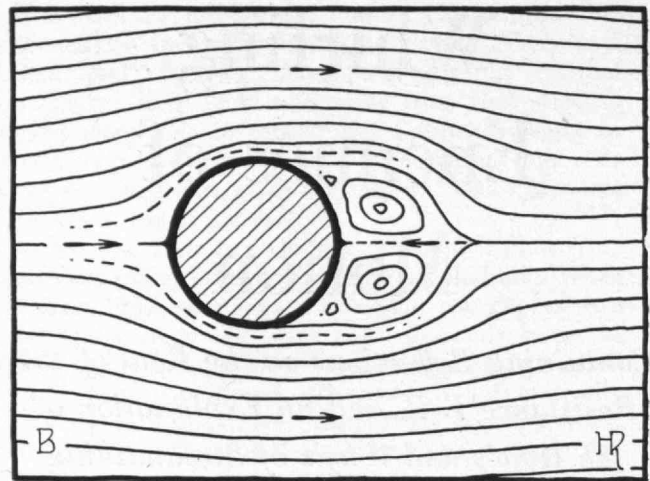
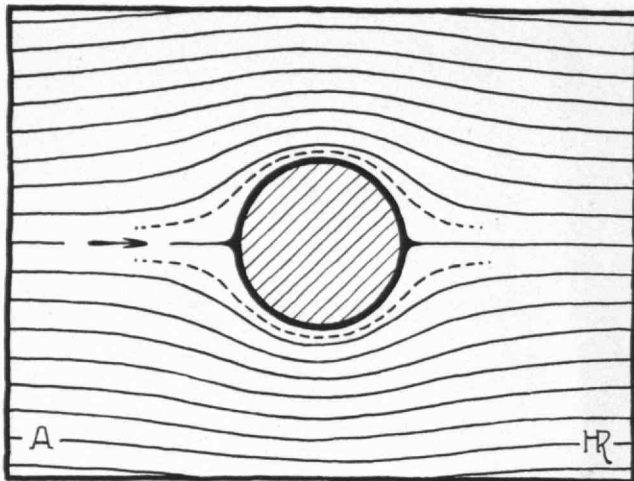
Above: A vortex occurring in flowing water behind a weir or spillway, lifting sand particles from the stream bed. Cyclonic twisters are much the same, the chief difference being that the fluid medium is air. Below: Profile of a surface whirlpool, such as that which forms in a bath tub when the drain is opened; the rotating core has been colored by dye. The elimination of vortex motion in the wake of moving vehicles is the object of streamlining.

Unfortunately for the hydraulic engineers, who might otherwise have enjoyed the mutual profit of a greater intimacy with the mathematical physicists, the latter created an imaginary, idealized fluid medium, thereby making the study of fluid motion an exact mathematical science — but on paper only; they failed to make the final, all-important steps of reconciling their theories

of ideal motion with the more complex phenomena displayed by such real fluids as air and water. What could be more useless to the engineer, asked the contemporary hydraulicians, than the mathematical proof that any body may move through a perfect fluid without the slightest trace of resistance? Even had they admitted the existence of simple skin friction — such as even a well-streamlined species of fish must move against — they would not have been much closer to the truth, for skin friction has obviously been only a minor impediment to the motion of our clumsy vehicles of the past decades.

Not until the von Kármán-Prandtl school of the present century began to look upon the vortex as the root of the resistance evil did the engineering world begin to place much faith in hydromechanics as a





useful tool. Aeronautics, relatively free from hereditary dogma and empiricism, reached adolescence at just about the time this modern German school began to apply the fundamentals of the classical science to engineering problems; and together the applied science and the profession have matured, largely as a result of the impetus caused by their mutual contact.

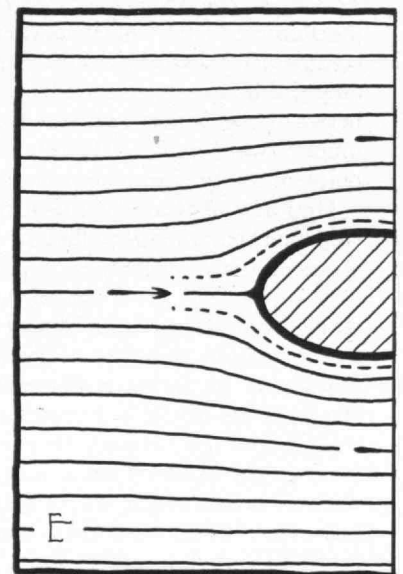
Those who have witnessed a twister in a cyclonic storm, or even the vertical spouts of dust that often arise from the ground between buildings in sudden gusts of wind, will have seen as individual examples on a highly magnified scale what takes place about innumerable centers in a fluid brought into a turbulent state by motion past a body whose abrupt curves have not been softened by streamlining. The whirlpool which forms in the water surface above an open drain in a tank or bowl is perhaps the most popular instance of a single vortex; as reproduced in the laboratory, this phenomenon easily lends itself to photographic reproduction, as will be seen on page 95. The water whirls about a vertical axis, moving faster and faster as the center is approached. This central, low-pressure region, instead of forming a bottomless hole, becomes filled with a column of water which rotates about its axis much as though it were a solid core. A bit of dye, for instance, will color only this more or less permanent core, leaving the surrounding water clear.

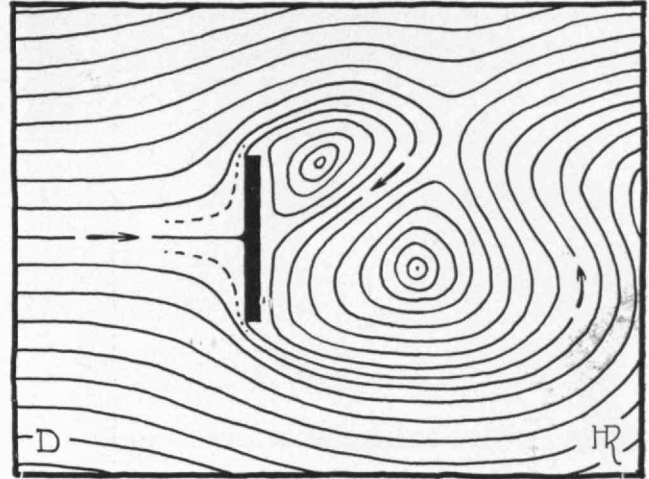
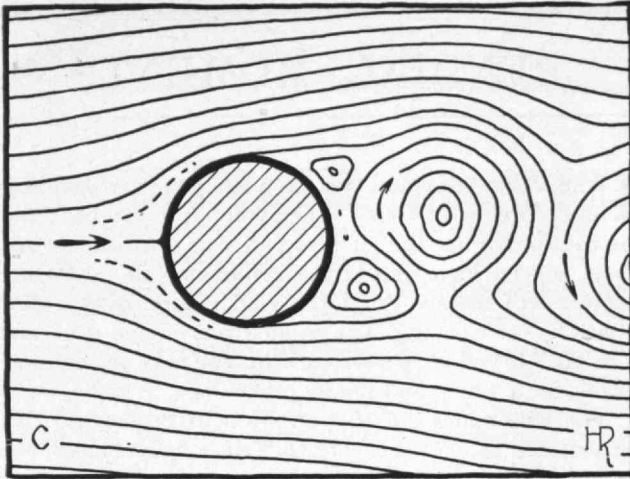
Vortices may differ from each other both in size and strength of rotation — the cores may be many feet in diameter, as in the case of cyclonic twisters, or almost microscopic; they may twist about lazily, or with tremendous violence. They sometimes occur either singly or in pairs, but more often they are interspersed throughout the fluid medium. The single vortex shown on page 95 is perfectly symmetrical about its axis, but when more than one occurs in a given vicinity, each tends to interfere with the form and translatory speed of the others. For instance, two vortices generated simultaneously at either edge of a vertical paddle will continue to propel each other along the surface of the water until they die out; indeed, the common ring vortex (the quiet pride of many a smoker) is quite capable of moving away under its own motive power. However, if one visualizes a turbulent body of water as composed of thousands of small and large vortices, all attempts to

distinguish the action of one from that of another, or even to outline an individual distorted whirl, will be seen to be futile.

As conceived by the early mathematicians, a long circular cylinder moving through an ideal fluid, broad-side on, would form the perfectly symmetrical system of stream filaments shown in Sketch A. Since pressure and velocity conditions fore and aft would then be identical, no resistance would be encountered. This flow picture may be achieved experimentally, but only by using a very viscous fluid (such as oil or glycerine) at a low velocity; skin friction is then the only form of resistance. More rapid motion, with a fluid as slightly viscous as water or air, will actually result in the formation of a pair of vortices, at first symmetrically arranged (Sketch B) but soon alternating regularly in occurrence and departure into the wake of the cylinder (Sketch C). Directly in front of the body, where the velocity approaches zero, the pressure rises above normal exactly as before; but in the turbulent wake directly behind the body the pressure falls considerably below that of the surrounding fluid, so that there is developed a steady force opposing forward motion. It so happens that the amount of skin resistance caused by a fluid of low viscosity is very small in proportion to this unbalanced pressure resulting from the form of the body.

Obviously a more rectangular cross-section would only augment the intensity and size of the vortices in the wake (Sketch D), thus increasing the form resistance; but by prolonging the stern into the streamline form now so popular, it has been found that the formation of the low-pressure vortex wake can be obviated almost entirely (Sketch





E). Energy is no longer expended in producing eddies; pressures fore and aft practically counterbalance, and tangential friction remains the only appreciable resistance to forward motion.

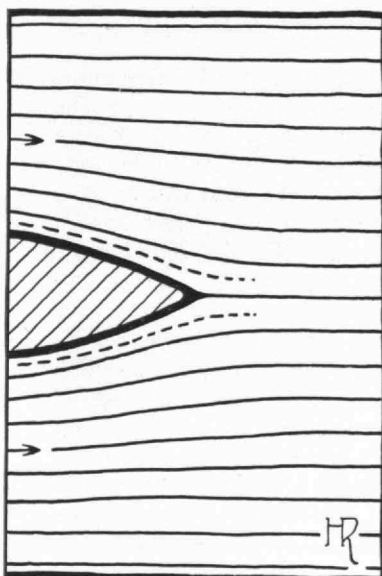
Following the trend set by airplane designers, it is now becoming customary to construct locomotives, automobiles, and even buildings in such a way as to reduce vortex formation — and hence unbalanced pressure — to a minimum. Every form of protuberance, whether a spare tire or even the handle on a door, is either concealed from the passing fluid or given a streamlined form to thwart the fluid's inherent tendency to produce a turbulent wake; and the general form of the vehicle itself is so rounded in front and smoothly tapered toward the rear that the fluid will not tend to tear loose from the profile and double back upon itself in low-pressure whirls.

It is true, of course, that perfect streamlining in so complex a body as an automobile is quite unattainable. Nor is it physically possible to obviate either skin friction or turbulence already existing in the natural masses of air and water of our earth, however ideal this might be. The trend is only in the direction of the maximum efficiency attainable under normal conditions, through

the modification of those factors under the control of man.

Yet what of the many other fields of engineering in which fluid motion plays a leading rôle; hydraulics for example? Surely streamlining might be just as economical a measure in these fields as well, but progress in this direction is only slowly gaining headway. Spillways, siphons, turbine inlets, and draft tubes are often unwittingly made sources of vortex occurrence, resulting in poor efficiency and the danger of separation (under low pressures, cavitation) occurring at points of abrupt curvature. Pipe joints, sudden changes in section, valves, short elbows — all are but further nests of turbulence, most of which are still considered too inconsequential to remedy. Yet only a few years ago streamlining an automobile was thought practically useless and even today it is more of a style than an actuality.

Since the motion of a vehicle through the air has a close counterpart in the passage of fluid through a pipe, it is only logical that scientists should begin to apply their analysis of turbulence to pipe flow as well; just as irregularities in the profile of a moving car add to the natural turbulence of the air, so do tiny irregularities along the pipe wall add to the turbulent resistance encountered by the fluid. The practical hydraulician has long since been driven to empirical methods based on the fact that the direction and magnitude of "pulsation" in turbulent flow will balance out over time. But modern applied hydrodynamics, not content with a blind arithmetic average, is inquiring into the mechanics of turbulence with open eyes and an open mind. Such problems as the behavior of particles in the immediate vicinity of the boundary walls, the relative effects on vortex generation of surface waviness as opposed to jagged roughness, the mathematical interpretation of velocity distribution, and the search for a method of measuring and expressing the magnitude of turbulent energy, are typical of the analytical trend. In every case, however, progress would be impossible if based upon the classical conception of vortices without beginning or end, which merely twist on inexorably through space and time. On the contrary, it is the very life history of the vortex — from conception on through gradual dissipation — which is the foundation of present-day fluid research.



For a description of the sketches on this page see the adjacent text. They are representations of what actually happens when variously shaped bodies move relative to a fluid medium. The streamline form at the left leaves no low-pressure vortex wake. The sketches were drawn directly from photographs of actual flow conditions made visible by particles of aluminum floating on or suspended in water



Bartlett

In response to the current fashion, even the steam locomotive is submitting to the deft fairing of the streamliner. Silhouettes like the above may, as a consequence, become as rare as clipper ships. In the war against the winds (see preceding article) the B. & O. has some streamlined steam power abuilding and the Pennsylvania specified streamlining in its recent record-breaking order for \$15,000,000 worth of electric locomotives

BENDING MOMENTS

IT IS a frigid day and you have left your car standing out of doors for hours. When you left it you took the precaution to use the choke when you shut off the engine, so you have gas in the cylinders, but now your starter will merely grind the cold engine over a few times before expiring. The recalcitrant engine does not "catch." If you have a strong arm, you may get out and crank for a while, and finally make it go. Why?

The Quidnuncs put this question to Professor L. F. Woodruff, '18, on the theory that since he had answered our queries on bridge, he doubtless could solve some of our minor motor problems. And sure enough, he was Johnny on the spot with a suggestion. Let Professor Woodruff, in his own *manière de parler*, tell you how he starts his car in extreme cold weather:

"When the starter is not spinning, but is merely turning slowly, the storage battery is called on to supply between 200 and 300 amperes, the current being the quotient of its normal voltage (usually six volts) divided by the sum of the starter and battery resistance. The voltage across the battery drops to about half its normal value, and even lower if the battery is in poor condition. This lowered voltage, about three volts, is all that is available for your ignition. It is not enough to give you a spark, or at least one hot enough to cause an explosion in your cylinders. What can you do about it?

"Purchase two ordinary dry cells, costing about 30¢ each; six feet of double-conductor wire, preferably armored; and a 'three-point' switch, single-pole, double-throw. Disconnect one of the low-tension leads from your induction coil and connect the two wires respectively to the empty coil terminal and the lead just removed. The wire from the coil goes to the common terminal of the switch. The two dry cells in series bridge the other two switch terminals. The wire from the lead which was removed from the coil terminal goes to one of the switch points, which may be called the 'non-booster' position.

"Another cold day. You throw your three-point switch to the 'booster' position. You step on the starter, and the engine turns slowly. Instead of only three volts for ignition, you have another three volts from the dry cells, making six volts, sufficient to give a hot spark. As soon as the engine catches, switch back to the 'non-boost' position to save the dry cells for the next cold start.

"In making the installation, the polarity of the dry cells relative to the main battery should be checked by noting the reading of the dashboard ammeter when the engine is still, but the ignition circuit closed. If normal ignition-circuit current is, for example, six amperes, the ammeter should read about nine amperes with the booster battery properly connected, but only three amperes if the polarity is reversed.

"If you are absent-minded and leave your three-point switch on the booster position, you will quickly

ruin the dry cells. To avoid this, put a spring on the switch to hold it normally on the non-boost position. With reasonable care the dry cells should last a season or two."

OUR own roving reporter, after a cruise through the physics laboratories, brings us a story to supplement last month's treatise on whiskers. We present it in his own choice argot:

"Seraphic blonds, fiery Titians, lustrous brunettes. Wispy strands of each in glittering cavalcade. Burnished golds, and icy platinums. Mellow nutbrowns and smouldering auburns. Filaments of each stepped jauntily onto the integrating sphere of M.I.T.'s color analyzer to have their radiance measured by Dr. Burleigh B. Gardner of Harvard and David L. MacAdam of Technology's Department of Physics. In behalf of anthropology occurred this parade of human hair before the reviewing stand of the analyzer and, as each strand passed by, the sensitive machine showed no preference, even for blonds. But it did record some highly interesting data.

"Under the direction of Dr. E. A. Hooton of the Harvard University Division of Anthropology, 53 hair samples were studied in a quest to define the colorimetric properties of human hair. The harvest of samples ranged in color from jet black to very blond, including an abundant assortment of reds. For each, Professor Arthur C. Hardy's ('18) color analyzer drew a spectrophotometric curve. Such curves afford a measure of the reflectance, or ratio of reflected light to incident light, and measurements were taken at all wave lengths from 400 to 700 millimicrons.

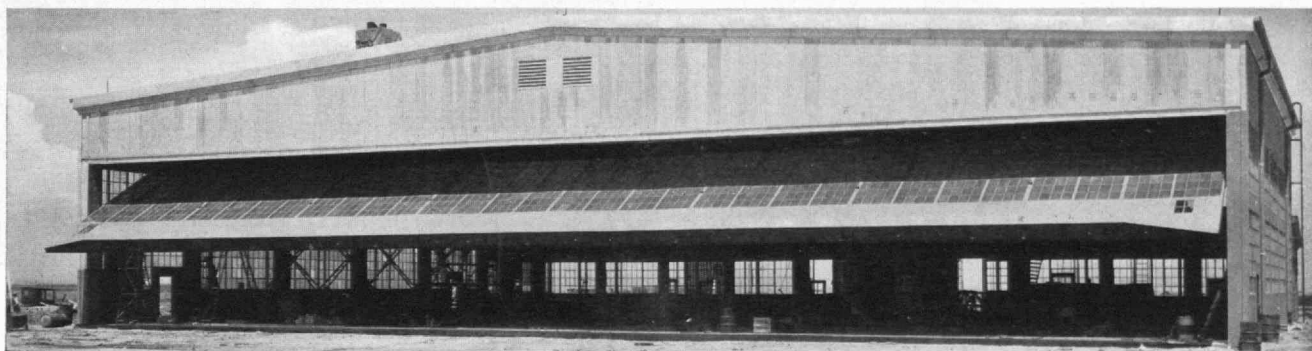
"Mae West-like, and impertinently enough, the lightest blond led the parade with a reflectance which was 15% greater at 700 millimicrons, the point of maximum reflectance, than the brightest red! The color curves showed an upward trend in reflectance as they passed through violet, blue, and green to the red end of the spectrum. All were quite simple, Dr. Gardner and Mr. MacAdam found, and ranged from practically straight lines to those having a decided curvature. Differences of hair color, it appeared, are due to changes in reflectance at the red end rather than at the violet end of the spectrum. Indicated also was that the distribution between the color of red and brown hair is due mostly to the disparity in reflectance in the blue and green bands of the spectrum.

"The samples, carefully sorted by eye, and plotted upon a 'scattergram' according to color and properties, including their respective reflectances at 546 millimicrons and 700 millimicrons, fell into three graded series, the first-mentioned wave length being chosen since it may be conveniently procured using a mercury arc and filter. One group ranged from black and dark brown through the medium browns to light blond. A second series was composed of browns with a reddish tinge, while a third consisted of true reds. Study of the 'scattergram' revealed that when hair reflects less than 47% as much incident light at 546 millimicrons as it does at 700, the eye distinguishes the red. When the ratio of reflectances is greater, the visual impression is brown. Similarly, a ratio less than .40 indicated the separation of the reds from the reddish browns.

"Complete colorimetric specifications of 20 of the hair samples were also calculated, utilizing the most recent method for the standardization of color. This method enlists spectrophotometric data to obtain three quantities; namely, brightness, dominant wave length, and purity. Brightness is expressed by the relative reflectance of a specimen shade and a perfect reflector, the nearest approach to which is a white magnesium oxide surface. Dominant wave length may be visualized as that color of the spectrum which most closely conforms to the sample color. Purity refers to the degree of similarity between the sample color and that of the pure spectrum color of identical wave length. Of particular interest from this study was the disclosure that the dominant wave length of these samples coincided almost exactly with the yellow band of the spectrum, despite the wide differences in visual colors ranging from deep browns to intense reds. Bleached blonds were also sifted in the light of the spectrophotometer's impersonal eye. Purity and brightness surged upward under peroxide's enlivening influence, but the dominant wave length was unchanged.

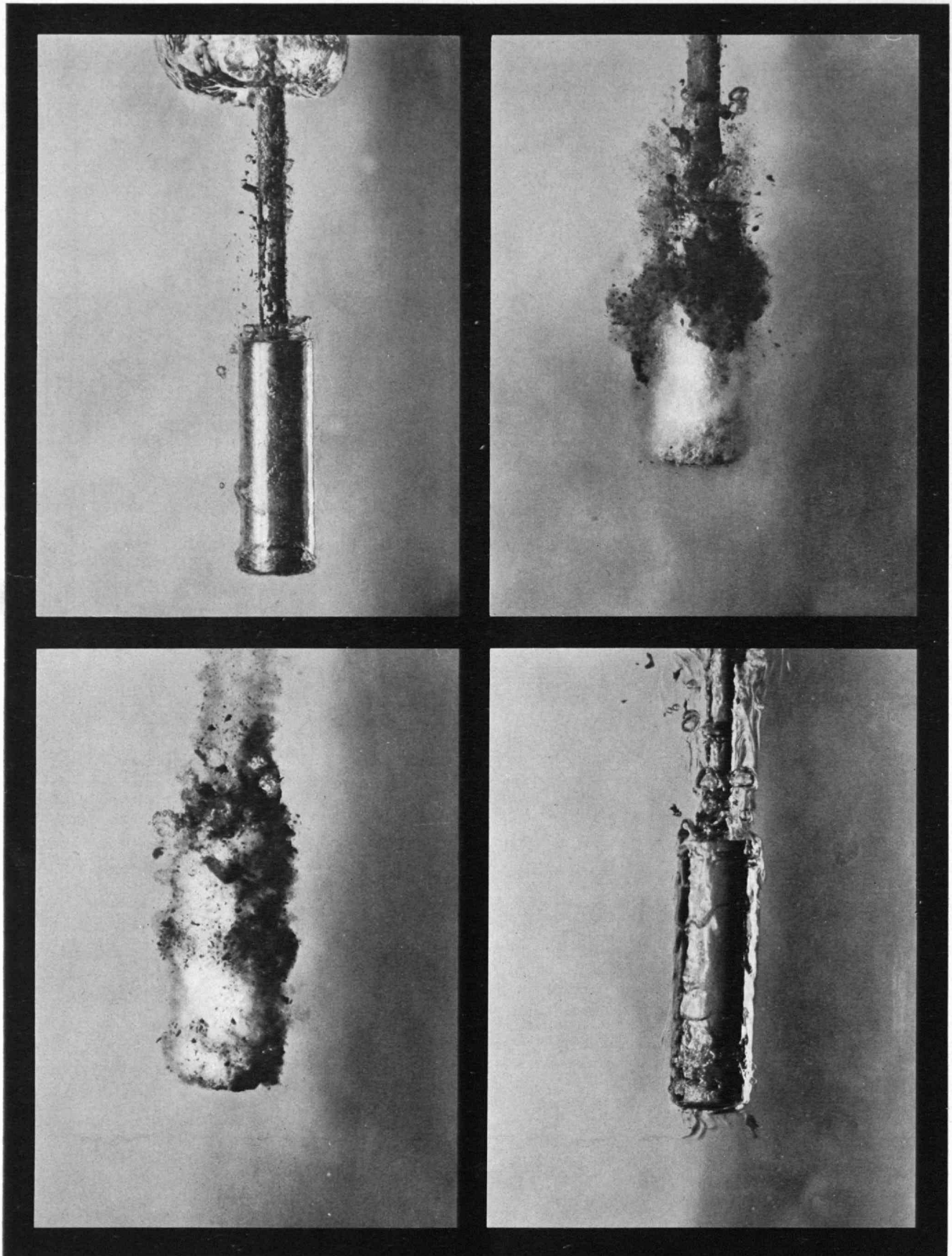
"Of definite practical value to anthropologists gathering data on the races scattered about the surface of the globe, was the finding that a portable instrument specifically designed to measure hair color could be readily built, and hence facilitate the analytical classification of hair color data assembled for their files. Important, too, was the additional illustration the research afforded of the fruitfulness of collaboration among scientists working in diverse fields."

THE QUIDNUNCS



World's largest single-leaf door as installed in the hangar of the Mid-Continent Air Express Line at the Denver airport

Detroit Steel Products Co.



QUENCHING

High-speed studies (Edgerton process) of what occurs when steel is quenched — that is to say, cooled — in various liquids. These photographs, made by Professor I. N. Zavarine, '20, of the Department of Mining and Metallurgy, show the beginning of quenching, using specimens at 850° C., in water (upper left), 5% Solution of NaCl (upper right), 10% Solution of NaCl (lower left), and mineral oil (lower right)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

December Docket

LAST month we described a new machine for solving simultaneous equations. Below we record the development of two analyzing machines for speeding the work of the "Master Key of Science."

Further progress in joining the creative imagination of the fine arts with the practical achievements of engineering is noted on page 103 (new illumination course and lectures on industrial design).

Other items gazetted: Another achievement of the Graduate School (103). Corporation Appointments (104); the late Professor Mulliken (104); Reunions Replanned (104); Visiting Committee Report on the Department of Physics (106).

50,000 Subtractions a Minute

THREE years after its completion finds the Institute's unique Spectroscopy Laboratory housing an elaborate program of investigations on the structure of matter as determined from the light emitted by atoms and molecules. This program, under the direction of Professor G. R. Harrison and Assistant Professors J. C. Boyce and J. C. G. Wulff, is made possible largely because the laboratory possesses several spectrographs of unusual power which are not duplicated elsewhere. One of these, a concave grating spectrograph of 35-foot radius of curvature, has been said by visiting spectroscopists to contain the most powerful diffraction grating ever made.

A short time after the first successful spectrum photographs were made with this instrument the laboratory staff found that with it one man, by working two or three hours, could take a sufficient number of spectrograms 40 feet long, each containing thousands of lines, to keep several men busy for six months or more measuring, computing, and tabulating the results. It soon became evident that to make best use of the unusual equipment available unusual methods of carrying out these processes must be devised. To meet this need, two entirely new instruments have been designed and constructed; one, still under development yet almost constantly in use, is a machine for measuring the wave lengths of spectrum lines directly from the spectrum photographs and for making all necessary computations automatically; the other, which is complete and has been in operation for more than a year, is known as an "interval sorter," and is designed to determine the energy levels of atoms or molecules from the spectrum lines they emit.

In measuring a spectrum, the plate is ordinarily put on a comparator, a machine with a carefully made screw with which measurements of length can be made to 1/25,000 of an inch. With this the operator carefully measures the distances of all the spectrum lines from

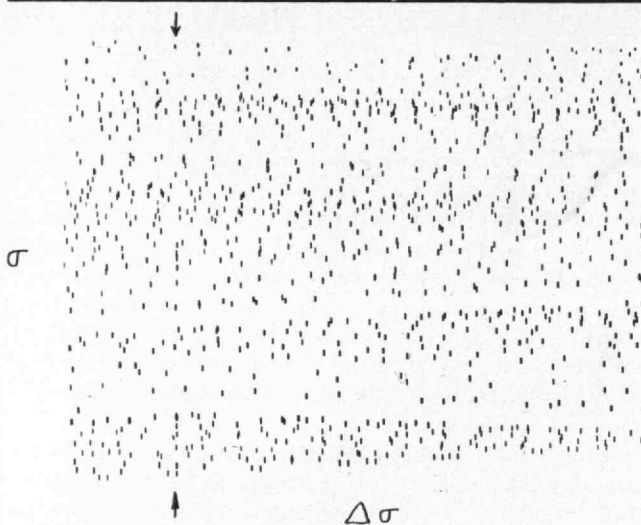
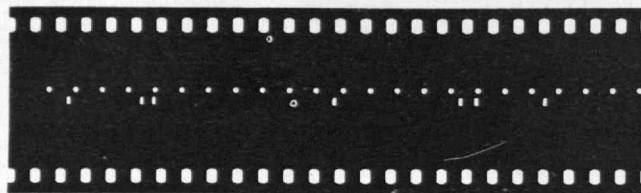
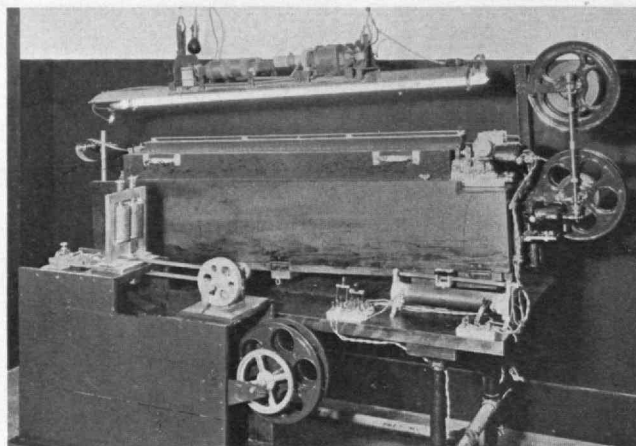
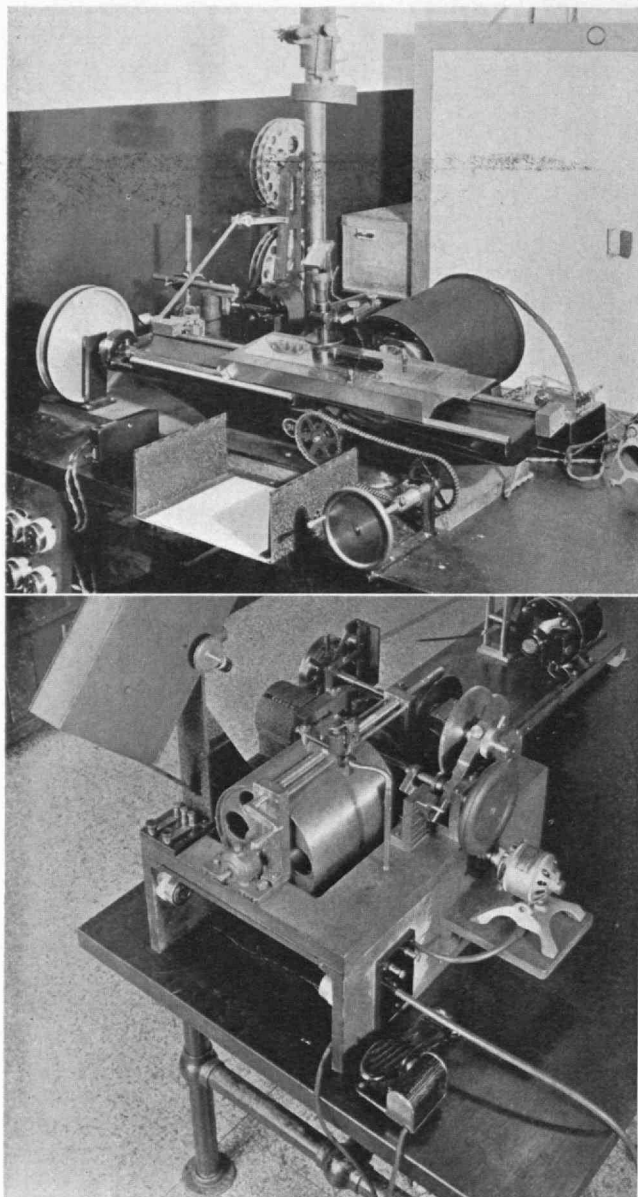
some standard line, and records his readings to six or seven figures, an operation which for a plate containing many lines may require several days. Since the length of the comparator screw varies with temperature, errors are introduced due to the warming up and cooling off of the screw during this period. Each plate is usually measured several times, and then the results are reduced by fairly complex calculations which take longer than did the original measurements. The order of these operations is usually such that the operator may not know his first final wave-length value for a week or more after he has begun to measure the plate.

In the wave-length measuring machine recently constructed at Technology, all of these operations are done automatically. A beam of light passing through the plate on the comparator actuates a photocell-amplifier combination, which, whenever the instrument is set on the peak of a spectrum line, actuates a thyratron which flashes a mercury arc. The light of this arc photographs on a moving film the readings of a set of rapidly spinning dials which record, at all times, the wave-length values corresponding to the position of the plate on the comparator. A complicated system of gears and differentials insures that these dials read the reduced wave-length values directly when the machine of which they are a part is belted to the comparator by means of a perforated steel tape.

It is found that with the machine as at present constituted a 20-fold gain of speed over older methods results, with a twofold increase in accuracy, and further developments which are now in progress are expected to double this increase of accuracy and to raise the speed gain to 200-fold. Tests made on the machine with amateur operators have indicated that their measurements, made with it, are superior, even though made at high speed, to those commonly made by experienced operators elsewhere.

Once the spectrum lines for a particular atom have been identified and measured, the next process is to determine the energy levels which give an indication of their structure. The spectroscopist takes the reciprocal of all the wave lengths and subtracts these one from another in a search for constant differences of wave number, which, when they recur more often than would be expected by chance, are indications of important energy levels in the atom. Usually these subtractions are made mentally one by one, it being not uncommon for a spectroscopist to pile up 100,000 subtractions during his winter evenings, only to find that the wave-length measurements he used were so inaccurate that the random coincidences completely masked the real ones which he was after.

The Technology interval sorting machine carries out all of these subtractions automatically, sorting out the intervals into neat piles so that the operator need only look at those which are in piles larger enough than



M. I. T. Photos

"That men may scan the record of each flame"

Two new instruments (described adjacently) for aiding investigations on the structure of matter. In the left column are shown the two elements of a machine for measuring the wave lengths of spectrum lines directly from spectrum photographs and for making all necessary computations automatically. It is 20 times faster than older methods. At the top of the right column is the "interval sorter," a machine that speeds up hundreds of times the interpretation of spectral data by computing 50,000 subtractions a minute.

Below the picture of the sorter is shown the tape upon which it punches holes representing spectral lines, and below this, the machine's final record in the form of dots on photographic paper which constitute a plot of wave number differences against wave numbers.

Both machines were developed by Professor G. R. Harrison, Director of Technology's Spectroscopy Laboratory and they are proving to be indispensable handmaidens to the spectroscopist. By speeding enormously the work of spectral analysis, both machines add notably to Technology's contributions toward mechanizing "the menial part of thinking."

the average to indicate that they correspond to real energy differences in the atom. The reciprocals of the wave-length values are recorded by punching holes at the proper positions in a paper tape perforated like moving picture film. This tape is unwound from a reel and fed into the machine, through which it passes horizontally, then over a roller, and back under itself through the machine again. A long mercury arc is suspended over the punched tape, and below it passes at right angles a sheet of photographic paper. Every time a hole in the upper portion of the tape passes over a hole in the lower portion the underlying photographic paper

is exposed at one spot for a brief instant, so when the paper is developed it is found to be dotted with marks whose positions are measures of the distance between the two holes producing them. Every line is thus subtracted from every other line within any desired distance, and the machine can carry out over 50,000 subtractions a minute and record the results. To interpret the record, one need only consider the developed photographic paper as being a plot of wave-number differences against wave number, each dot giving a point on this chart. By placing a straight-edge parallel to the wave-number axis, one can readily determine which wave

number differences occur most often and find which lines combined to give these differences. Thus, by means of a simple mechanism, the work of interpreting spectral data of this sort is speeded up hundreds of times.

This new powerful artillery is at present being used in the Spectroscopy Laboratory to attack the problems of the structure of the rare earth elements, whose spectra are of such complexity that they have defied analysis thus far, although they are of particular interest because chemically these atoms behave so much alike, although actually they are so different.

New Light on Illumination

WE ARE in the midst of startling advances in the lighting art. Evidences are on every side: the new gaseous-conduction lamps, built-in lighting for interiors, improved devices for the measurement of light. It is generally felt, however, that the education of the illuminating engineer has not kept pace with the recent progress of the industry. Most electrical engineering graduates, though excellently trained in their field, are entirely ignorant of architecture, art, color, and the fundamentals of how we see, a knowledge of which is so essential to the illuminating engineer. Even the introduction of lighting subjects in the fourth or fifth year of a college course appears to be unsatisfactory. Evidently what is needed is an entirely new course based, not exclusively on engineering or on art or on business, but designed of a combination of these elements to fit men specifically for this complex field which we call illuminating engineering.

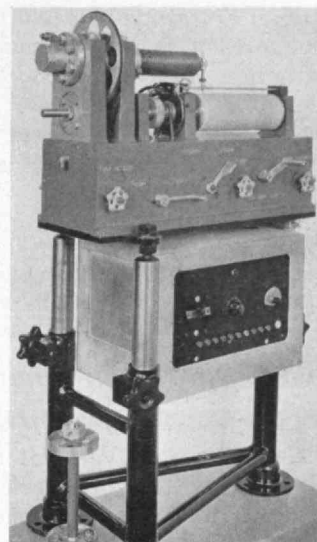
To meet such need, the Institute has introduced a new course of study — the first four-year illuminating engineering course in the country. The course is by no means one of narrow specialization, but gives a training which is as broad as is consistent with the development of exact thinking. The student in his first years studies English, mathematics, history, economics, humanics, public speaking, psychology, as well as freehand sketching, modeling, history of architecture, European civilization. The work in architecture and color is started early in the course and continues through the later years in parallel with the engineering training. In the third and fourth years, the work becomes more specialized and includes the principles of electrical engineering, optics, planning principles, estimating, electrical equipment of buildings, as well as a rather thorough treatment of the principles of incandescent and gaseous-conduction lamps, the science of seeing, the calculation of illumination, and the design of interior and exterior lighting.

The details of the course have been developed by Professor Parry H. Moon, '27, under the direction of Professor Dugald C. Jackson, head of the Department of Electrical Engineering.

Recognition of the Graduate School

NOTIFICATION has been received by Dr. Compton of the election of the Institute to membership in the Association of American Universities. Because this organization hitherto has considered engineering schools outside its province, the election of Technology is con-

After trying all available types of high-speed indicators for testing their aircraft engines, the Wright Aeronautical Corporation has adopted the adjacent one designed in the aeronautical engineering laboratories of the Institute. Essentially, the instrument is a machine for plotting a curve of cylinder pressure versus crank angle for internal combustion engines of the high-speed type. (See The Review for March, 1934.) The indicator was developed under the general direction of Professor Charles F. Taylor '29, by Professor E. S. Taylor '24, C. S. Draper '26, and Edward Gugger, constructor of apparatus



sidered as recognition of the high quality of its graduate work, particularly in those fields of study, such as science, which are common to all universities.

The Association of American Universities was founded in 1900 by a group of 14 institutions for the purpose of considering matters of common interest relating to graduate study. President Charles W. Eliot of Harvard University, who earlier was a professor at Technology, served as the Association's first president.

Lectures on Industrial Design

W. STARLING BURGESS, distinguished designer of *Enterprise* and *Rainbow*, the successful defenders in the last two international yacht races for the America's Cup, has been appointed a special lecturer in the Department of Mechanical Engineering for the latter part of the academic year.

Long interested in design as an art, Mr. Burgess is noted not only for his achievements in naval architecture, but in the field of aeronautical engineering and automobile design. As early as 1904 he began building yachts and commercial vessels at Marblehead, Mass., and in 1910 he started the design and construction of airplanes. His subsequent contributions in this field won for him in 1915 the Collier prize for the greatest progress in aviation for the year previous, when, because of the war, every effort was being made to develop aircraft. In recent years, in addition to his interest in yacht design, he has given much thought to the design of a new type of automobile. With Buckminster Fuller of Connecticut he developed the Dymaxion car, an aerodynamically refined machine with three wheels.

His lectures at the Institute will include discussion of design as an art, with special reference to lines and harmony of form, racing yachts and their hulls, structural problems, rigging, the aerodynamics of sails, analysis of the designs of the cup defenders, *Rainbow* and *Enterprise*, and their performance, and the application of design principles to airplanes and automobiles.

Mr. Burgess entered Harvard University in 1897 and then enlisted for service in the Spanish-American War in 1898, serving as a gunner's mate on the

U.S.S. *Prairie*. In the World War, Mr. Burgess held a commission as a Lieutenant-Commander in the Construction Corps of the Navy, and served in the aircraft design section of the Navy Department. After the war he took up his independent work in yacht design.

The School of Architecture is also presenting lectures on industrial art. Last month Richard F. Bach, who assembled the present exhibit of industrial art at the Metropolitan Museum spoke, and on December 12, Walter D. Teague will speak before Dean Emerson's class in the Architectural Humanities.

To Corporation Committees

THE election of Hon. Redfield Proctor, '02, former Governor of Vermont and Past President of the Technology Alumni Association, to membership in the Executive Committee of the Corporation has been announced by President Compton. Mr. Proctor will fill the vacancy left by the expiration of the term of Mr. Charles T. Main, '76. Mr. Main will continue, however, as a *pro tempore* member until Dr. Elihu Thomson's health permits him to resume his duties on the Committee.

Dr. Compton has also announced the election of Dr. Alfred L. Loomis, well known scientist and member of the firm of Thorne, Loomis and Company of New York City, as a member of the Finance Committee of the Institute.

Samuel P. Mulliken, 1864-1934

BY THE death on October 24 of Samuel Parsons Mulliken, Professor of Organic Chemistry, the Institute has lost a distinguished alumnus and faculty member, and many of the Faculty and Alumni have lost a beloved friend. At the end of the present academic year he would have completed 40 years of service on the staff.

Professor Mulliken cleared, set in order, and made his own the field of organic qualitative analysis and was long preëminent in it. His large work, "A Method for the Identification of Pure Organic Compounds by a Systematic Analytical Procedure Based on Physical Properties and Chemical Reactions," in four volumes, is in wide use in this country and in Europe.

At the Institute, Professor Mulliken with Professor Arthur A. Noyes introduced into the third year course in organic chemistry experiments in the identification of pure substances and of the ingredients of simple mixtures. Later Professor Mulliken developed the graduate course in organic qualitative analysis in which the students learned how to manipulate small quantities of material, to determine its physical properties and investigate its chemical reactions — a training invaluable for research. In this course, too, the students learned much from the personality of the professor, his persistence and unfaltering integrity, his insistence upon exactness and upon evidence which should be unequivocal.

Since 1925 he had general charge of instruction in undergraduate organic chemistry. He also gave a graduate course on heterocyclic compounds, and directed a

number of doctoral researches on type reactions and procedures of service in the identification of organic substances.

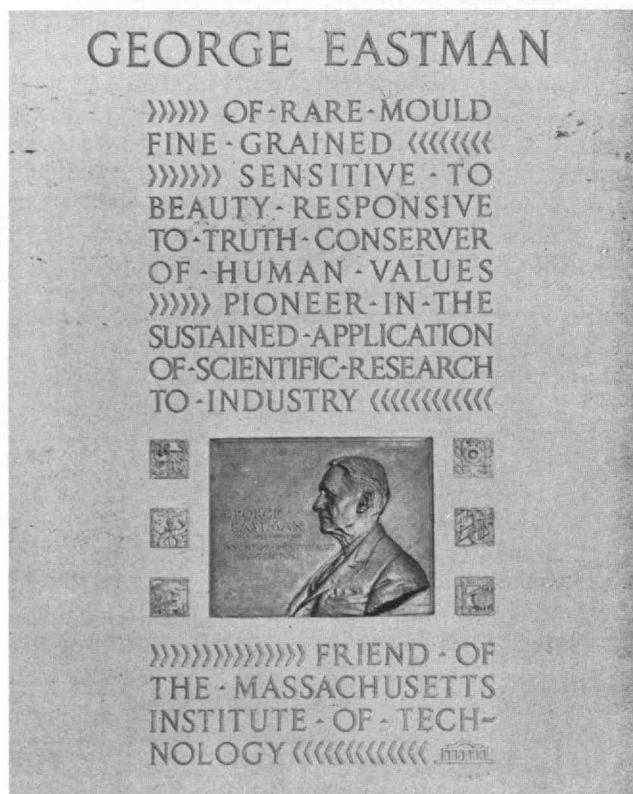
New Reunion Plans

MEETING for the 175th time, the Alumni Council auspiciously began its year's work on October 29 with an attendance of 98, with its new President, Charles E. Smith, '00, in the chair, and with an important vote affecting our entire reunion scheme.

During the summer a committee, composed of H. E. Worcester, '97, D. G. Robbins, '07, R. S. Stevens, '17, H. B. Richmond, '14, Chairman, and Ralph T. Jope, '28, Secretary, studied plans for future reunions, and the following report presented by it at this meeting and unanimously accepted by the Council, recommends abolishing the All-Technology five-year reunions and the substitution in their place of an annual alumni day:

"Technology men of former years delighted in the familiar yell, 'We are happy; Tech is Hell!' It is only logical that reunions of alumni who went through the old Technology should reflect this same spirit. Although numerous satisfactory reunions have been held, there are many of our alumni who have questioned if the 'once-in-five-year-reunion plan' has not outlived its usefulness.

"Technology of today is a very different Technology from that of even two decades ago. While alumni in general are familiar with the high academic standards of the Institute, far too small a number are acquainted with



M. I. T. Photo

Memorial to George Eastman as placed near the entrance of Technology's Research Laboratories of Physics and Chemistry which bear his name



Kaufmann and Fobry

Exhibit presented by Ford at the Fair. Walter D. Teague, who designed the exhibits in the Ford building, lectures at the School of Architecture on December 12

either the vastly improved conditions of student life or what is being done to increase the contacts between the Alumni and the Institute for the benefit of both.

"It has, therefore, seemed fitting that in the conduct of future reunions their character be changed so that alumni may have an opportunity of learning what is taking place at Technology. It is felt that if an alumnus becomes familiar with current student life, as well as with the Institute's present academic facilities, he will more than ever be proud of her achievements and in turn be eager to send his son and his neighbor's son to the Institute rather than trying to spare them from what he may still think of as the 'hell and horrors' of his by-gone years.

"It has seemed desirable to work out some plan for reunions which not only would bring back more alumni to Technology, but also would maintain continuous alumni contact with the Institute. This would also overcome one of the difficult problems in the conduct of the present 'once-in-five-year-reunion plan' as it is now necessary to apply almost resuscitation methods to revive the enthusiasm which has been allowed to expire during the intervening period of about four years.

"In planning any new schedule of reunions, their effect on two other important alumni activities must be considered. They are: (1) the annual dinner, now held in mid-winter, and (2) the program proposed by Professor L. F. Hamilton's Committee for Stimulating Greater Activity of Boston Alumni.

"It is the opinion of our Committee that the present Annual Alumni Dinner is a misnomer, as it is attended almost exclusively by Greater Boston Alumni. The New York Alumni have held dinners as large as some of those held in Boston. These Boston dinners obviously have ceased to be representative all-Technology dinners.

"Your Committee investigated reunion plans of other colleges and discussed the subject with many Alumni and with Dr. Compton. A tentative plan was

evolved, the outline of which was presented by letter to Class Secretaries and to the Secretaries of the Technology Clubs. Of the replies received, 66 were in favor and only three against the new proposal. Many valuable suggestions were received, the more appropriate of which have been incorporated in this report or passed on to the proper committee of the Alumni Association.

"So general was the Class and Club Secretary approval that your Committee feels it is now in order to present its plans to the Alumni Council in the form of specific motions. Your Chairman, therefore, moves and your Secretary seconds these resolutions:

"1. Resolved that the All-Technology Reunion for 1935 be dispensed with.

"2. Resolved that the day before Commencement be designated as Alumni Day, and that an appropriate committee be charged with the carrying out of the activities of that day.

"3. Resolved that the mid-winter dinner held at Technology or in Boston be dropped.

"4. Resolved that an All-Technology dinner be held on the evening of Alumni Day.

"5. Resolved that a program of one or more winter meetings be held at Technology, primarily for Boston Alumni.

"It would be premature and perhaps inappropriate to include in this report details for the conduct of Alumni Day or for the mid-winter local meetings, yet the wisdom of the acceptance of this report would depend in part on how the new activities were carried out. Your Committee desires, therefore, to comment briefly on what it would consider a proper program for the new events.

"Alumni Day would become a truly 'Take Me Back to Tech' day. It would be asked of classes holding five-year reunions that they hold them at such a distance from Boston and on such dates that the groups could conveniently come in a body to Technology on Alumni Day. In any one year it would be expected that classes holding reunions that year would have the largest attendance, but a real attempt would be made to have a good attendance from all classes on Alumni Day.

"By the adoption of this plan, Alumni returning for their individual reunions would be given the added advantage of familiarizing themselves with the new Technology. Many Tech men have already expressed the desire of reestablishing contact with the Institute, as well as renewing old friendships. The fulfillment of this wish would be in accord with President Compton's idea of stimulating greater Alumni interest and participation in Technology affairs.

"One of the main features of Alumni Day would be an 'Open-Door Policy' — with faculty and staff at their offices to meet former students, and to discuss 'old times' and mutual problems. In addition, particularly important scientific experiments could be demonstrated by the younger members of the staff. The Faculty Club has already agreed to participate in arranging this schedule if this recommendation be accepted by the Alumni Council. The Graduate Dormitories could perhaps serve as a central meeting place for Alumni, with separate headquarters set aside for each class represented.

"Alumni Day would be climaxed by an Alumni Dinner held in the evening. It would thus be possible for the attendance to include not only those within easy commuting distance of Boston but also all others who have attended Alumni Day. Likewise, it would, we believe, be a desirable feature to entertain the Commencement speaker that evening and to pay special tribute to particular Alumni groups, such as the 25- and 50-year classes. Although Alumni Day would officially end with the Dinner, those Alumni who wished could remain for Commencement exercises on the following day.

"The success of last winter's informal mid-winter dinner is a signal for the repetition of similar events with emphasis on informality and moderation of price. It is, therefore, felt that the Assemblies Committee will have no difficulty in presenting a winter program for Boston Alumni that will have a very direct appeal to them.

"Your Committee earnestly believes that the substitution of this program for the present plan not only will increase the acquaintanceship of Alumni among themselves but also will unite the Institute staff and Alumni to their mutual advantage."

AFTER the Council had approved this report and its five resolutions, it accepted the following recommendation of its Executive Committee:

"The Executive Committee recommends that the Assemblies Committee be charged with the responsibility for formulating and carrying out the program for Alumni Day.

"The Executive Committee further recommends that the Executive Committee of the Alumni Council be authorized to appoint, annually, additional members of the Assemblies Committee and to appoint subcommittees to assist the Assemblies Committee; such additional members of the Committee or subcommittees to serve for one year and to be appointed after receipt of suggestions from the Assemblies Committee." The Assemblies Committee thus becomes one of the most important committees of the Association.

Corporation Visiting Committee Report

EACH year The Review, at the request of the Corporation, presents summaries of the discussions and transactions of the Departmental Visiting Committees which are playing such an important part in bringing to our curriculum the advice and experience of alumni and others prominent in those fields for which our departments train men. Below is a condensation of the report covering the Department of Physics. This report is largely devoted to research and supplements an earlier one devoted to instruction.

REPORT OF THE VISITING COMMITTEE OF THE DEPARTMENT OF PHYSICS*

In dealing with "the general efficiency of the research of the Department," the Committee sub-divided the subject into three parts:

* The Committee members for 1933-34 were: William D. Coolidge, '96; Alfred L. Loomis, Harlow Shapley, and Frank A. Vanderlip. Drs. H. A. Barton, and F. K. Richtmyer, who later became members of the committee, and President Compton, K. K. Darrow, J. C. Slater, and G. R. Harrison were present.

First: Projects which have already yielded important results of a theoretical nature. Professor B. E. Warren's ('24) research on the structure of glass, liquids, and amorphous solids, by x-ray crystal analysis. By brilliant extensions of methods previously used for crystals, the fundamentals of molecular arrangement in amorphous substances have been for the first time satisfactorily interpreted. This is an achievement of the first importance in the structure of solids, and puts Professor Warren in the front rank of experimental physicists at the Institute.

H. M. O'Bryan and H. W. B. Skinner's research on the far ultraviolet, or soft x-ray, spectrum from targets of light elements bombarded by electrons. Though not the first time such measurements have been made, these are the first results accurate enough to give useful information regarding the free electrons of the metal, which take part in these transitions. These researches have already been the occasion of considerable theoretical work, shortly to be published.

Assistant Professor Hans Müller's research on the dielectric properties of Rochelle salts. This substance shows dielectric properties analogous to the magnetic properties of iron, explained by the rotation of the electrical dipoles formed by the water molecules, as ferromagnetism results from the rotation of magnetic dipoles. Professor Müller has contributed extensively to the experimental and theoretical knowledge of this extraordinary substance, making an essentially new suggestion as to the peculiarity by which it possesses two Curie points rather than one.

Associate Professor M. S. Vallarta, '21, and Abbé Lemaître's ('27) research on the paths of cosmic rays, regarded as charged particles in the magnetic field of the earth. These calculations provide the mathematical theory to agree with the experimental results of Dr. Arthur H. Compton and others on the latitude variation of cosmic rays, and on the east-west variation of intensity. The agreement with experiment is good, and has provided full demonstration that the cosmic rays contain an important component of positively charged particles.

Second: Technical projects which represent important advances:

R. J. Van de Graaff's high-voltage generator, which now is in working order, though the vacuum tube is not yet built. This will be mentioned again in more detail.

E. S. Lamar and Overton Luhr's proton source. This is a discharge tube with a higher yield of protons than was possible with previous forms, and should prove extremely useful in nuclear disintegration work.

Professor D. C. Stockbarger's ('19) artificial production of lithium fluoride crystals. This compound, very difficult to crystallize, is transparent further into the ultraviolet than almost any other solid, and plates of it would be highly useful in ultraviolet spectroscopy. Dr. Stockbarger's technique is proving more successful in making artificial crystals than any yet tried.

Professor G. R. Harrison's interval sorter for the analysis of complex spectra. This device saves so much time in the necessary computations that it makes possible the analysis of spectra so complex that they would be practically impossible without it. Already by its use W. E. Albertson, '33, has made (*Continued on page 114*)

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MAIL RETURNS

Editor's Note: The Review presents below two more letters commenting on John C. Sherman's criticism, in the October issue, of modern technical education. Readers who missed Mr. Sherman's letter are referred to that issue, page 27, and also to the November issue, page 70, where M. W. Davidson, '26, attacked some of Mr. Sherman's conclusions. The first letter is from William H. Timbie, Professor of Electrical Engineering and Industrial Practice; the second, from Albert A. Lawrence, instructor in English and History, both of M.I.T.

Educational Advances in Electrical Engineering

DEAR REVIEW:

In his letter to President Compton, which appeared in the October issue of *The Review*, John C. Sherman, '95, asked the question: "Are the colleges in line today?"

Inasmuch as Mr. Sherman graduated from the Institute in Electrical Engineering, and offered his criticism in such a frank and yet in such a friendly manner, I believe that we in the Electrical Engineering Department owe it to him to answer his query in an equally frank and friendly spirit, at least as far as it concerns the Department. This letter, then, is just the Institute talking over its problems with one of its successful alumni.

At the very start, let us state that we are in thorough agreement with Mr. Sherman that an engineering college should afford to each student the maximum opportunity and assistance to develop his individual bents and powers. The mass production of engineers, all moulded into a standard educational form, must result in dead-level mediocrity in which initiative and individualism have been crushed. To develop individuality is a major problem which has long been recognized and grappled with by the Electrical Engineering Department. What progress we have made toward its solution can best be shown by a brief review of the educational experiments and innovations made during the last 27 years.

The importance of research in our educational scheme was early recognized by the Institute, and in 1907 Professor D. C. Jackson was called to head the Department, in order, among other things, to stimulate and organize research in the already rapidly expanding field of this youngest branch of engineering. So great was the progress made that when the War gave an unprecedented stimulus to research, this Department had already won world-wide recognition for its accomplishment, and students flocked to M.I.T. to engage in post-graduate work, with the result that for years we have led all the engineering colleges in the United States in the number of post-graduate students enrolled in electrical engineering.

Now, great as has been the value of this post-graduate research in adding to the world's store of scientific knowledge, and in developing outstanding research engineers for industry and engineering colleges, of even greater value has been the intellectual stimulus it has given to the whole undergraduate body and to the instructing staff of the Department. Research and an investigatory habit of mind have so permeated the students and staff that research attitudes and methods are applied not only to engineering problems, but also to the very educational process itself. Our curricula and methods of instruction are being constantly subjected to rigorous analysis in an effort to determine real educational values and to measure actual results. The research and investigatory spirit of the instructing staff has proved a most (Continued on page 110)

Toward a Broader Curriculum

DEAR REVIEW:

The letter of Mr. John C. Sherman, '95, published in the October number of *The Technology Review*, has aroused a good deal of discussion, especially within the student body. Several freshmen have asked me candidly whether I thought that they were making a mistake in taking four years out of their lives to acquire what Mr. Sherman would probably call an education of doubtful benefit. In most cases, I have been able to point out some very real advantages obtainable at M.I.T., but at other times I have felt myself rather severely handicapped. This feeling proceeds, I think, from the atmosphere of uncertainty which is so widespread at the present time. In an effort to clarify my own mind so that I should be better qualified to answer questions by undergraduates, I have set down my reactions to what seems to me the more significant parts of Mr. Sherman's letter. I think you have done a real service to those interested in the welfare of the Institute by publishing his communication.

Mr. Sherman's letter clearly indicates that there is an ever-increasing need of an effort on the part of the Institute to develop some degree of social consciousness in the minds and attitudes of the students. An acquaintance with the world as it exists today seems to me a prime requisite for every graduate of the Institute. This knowledge, based on an adequate historical understanding, is absolutely essential in the modern world. An extension of the work of the economics and sociology, English and history, and modern language departments is called for. With the increased attention that everyone is paying to governmental problems, M.I.T. should have a department devoted to the study of those questions. It seems to me that more time should be allotted in the junior and senior years for an attempt at the acquisition of this very necessary "social" point of view. This assertion is based on the response which a class of 16 juniors and seniors showed last spring. They were eager to criticize many tendencies manifest today, but they were even more interested in learning social and economic terminology and points of view. This side of their development had been arrested by their too narrow specialization in their chosen field. They were in danger of becoming what Mr. Sherman calls men devoted to the "collection and decoding of extant data."

Mr. Sherman also questions another aspect of the training received at M.I.T. He suggests that there are too many highly specialized technicians being turned out. Very likely he is pointing in the right direction by questioning this productivity of the Institute. At least one is beginning to hear from industry the demand for less *highly* specialized men. The call today is for the more *broadly* specialized man to tend the many special, single-purpose machines introduced by the advent of high-speed power production. The point will be obvious to anyone who was lucky enough to get behind the scenes in the Science Building at the Chicago Fair. Broadly trained men had to doctor the sick machines every night. The man who controls an aluminum plant with instruments and pyrometers involving a knowledge of electricity, metallurgy, and chemical engineering, must of necessity be a broadly specialized technician. He has to be widely acquainted with many different phases of industrial technique.

This production of the well-rounded man should not, however, obscure another factor that should continue to make M.I.T. of the first importance in the (Concluded on page 118)

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The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

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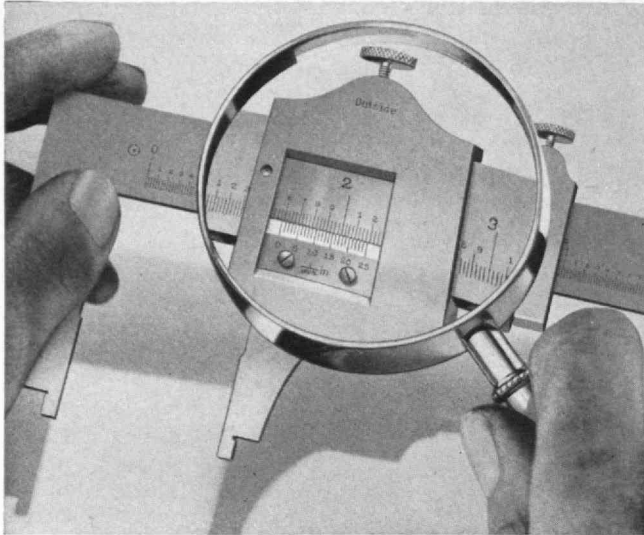
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EDUCATIONAL ADVANCES IN ELECTRICAL ENGINEERING

(Continued from page 108)



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effective stimulation to original thinking on the part of the student body, both graduate and undergraduate. Such a departmental policy applied to both students and staff is the very essence of coöperative individualism, which is the only form of individualism which can be productive in the set-up of our modern society.

During the years immediately preceding the War, Professor Jackson was making a comprehensive study of the coöperative plan as applied to engineering education. He had long appreciated the value to an engineering student of some industrial practice of the right kind and extent, either before he took up his engineering studies, or while he was engaged in them. In 1917 Professor Jackson, along with Mr. Magnus Alexander, then of the General Electric Company, had worked out what is known as the M.I.T. Coöperative Plan, and in 1919 it was put into operation in the Electrical Engineering Department in conjunction with the General Electric Company. In succeeding years other companies were added, until now coöperative relations are maintained with the American Telephone and Telegraph Company, the Edison Electric Illuminating Company of Boston, and the Boston Elevated Railway, as well as with the General Electric Company.

Students admitted to this course (about one-third of the juniors, seniors, and graduate students in electrical engineering) must have satisfactorily completed the first two years of the Electrical Engineering course or its equivalent, either at M.I.T. or at some other educational institution. Beginning with the summer following the sophomore year, the school year consists of three terms, two of them concurrent with the school terms at the Institute, the third consisting of a somewhat shorter summer term. The coöperative student spends alternate terms at the Institute and at the plant of one of the coöperating companies. This allows for a vacation averaging five weeks each year.

The successful completion of this course requires three years, in addition to the time spent on the freshman and sophomore work. During the periods he is located at the plant of the coöperating company, the student carries on two regular Institute studies, conducted either by local members of the Institute staff, or by non-resident members located in the vicinity of the plant. By utilizing this time, and the three summer terms, a successful student in the Coöperative Course completes the entire undergraduate curriculum and one full year of graduate work. Upon graduation he receives both the B.S. and M.S. degrees in Electrical Engineering. A student takes all his engineering practice in the various plants of one comprehensive company, where his practical work is as carefully planned and supervised as is his course of studies at the Institute. This does not mean that all the students of one company receive the same engineering practice, but rather that the progress of each student through the different plants of that company is determined largely by his tastes and his ability. His course is so laid out as to develop as completely as possible his individual powers and aptitudes. This policy, as will be explained later, is no less true of his course of study at the Institute.

The results of this plan have shown that the student becomes more interested in his Institute studies, since he already appreciates the need of them and can see the specific industrial uses to which they are put. He approaches his studies more intelligently. He gains a clearer view of the comprehensiveness of the fundamental laws of science and of their correlation in the many branches of engineering. Participation of the right kind in real engineering problems not only stimulates the

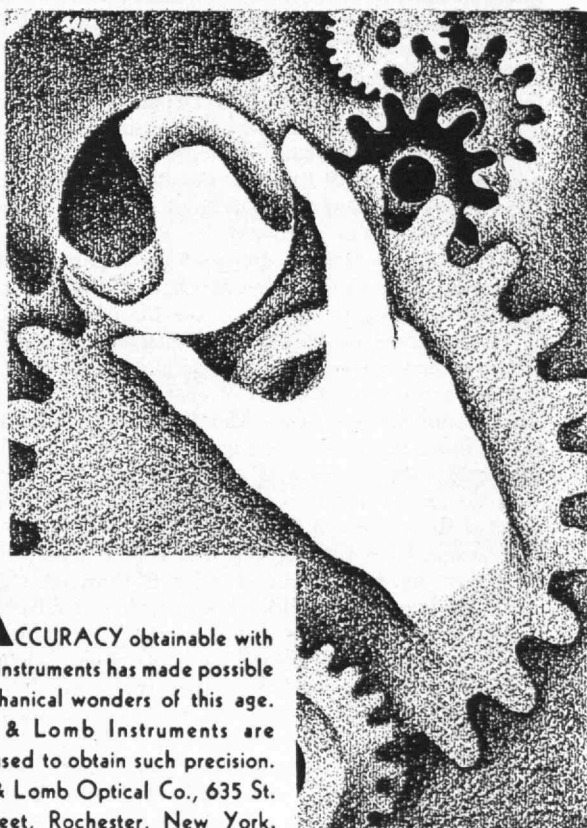
student's creative imagination, but also affords unusual opportunities for him to try out his ideas. Finally, when he graduates he is acquainted with corporate organization and business procedure. There is for him no blind groping in an effort to find his place. He knows his way about. He also knows the importance of a reputation for "carrying through," and of maintaining a sense of responsibility and a sense of loyalty.

In 1925 the "Honors Group" system was inaugurated in the Department. Students who have shown more than average ability during the first two years are invited to work under a system which relieves them of the obligation to attend classes, quizzes, and regular examinations, leaving such attendance to their own judgment. These students attend conferences with designated counselors and advisers. Instead of attending the regular examinations, they present themselves for comprehensive examinations, one at the end of the junior year, and another at the end of the senior year. These students, in consultation with their counselors, lay out their own program for each term, within the scope of the work expected for that term. They are encouraged to study along their own chosen lines, but more deeply and more comprehensively than those students who attend the regular classes are able to do. It is to afford them extra time for such individual work that they are excused from class-room attendance. Their progress is carefully watched and supervised by their counselors. Their final examinations are comprehensive, not in the sense that an examination covers a larger field of engineering, but rather in the sense that the students are tested on their grasp of fundamental principles and of their applications to engineering problems. They are tested not on what they know but on what they can do. These examinations are both oral and written,

and are made up and conducted by special examining groups consisting of several members of the department instructing staff plus others from industry and from other engineering colleges. . . .

The most outstanding feature in the educational policy of the Department has been to educate the individual, not to carry on mass production. This is most clearly seen in the construction of each student's program of subjects, whether he is a member of the Honors Group or not. The field of electrical engineering has embraced such a multitude of engineering applications that no one student could possibly cover the whole field thoroughly in four years, or even in five. The fundamental principles, however, are reducible to a main stem of mathematical physics related to electrical engineering. These subjects, arranged in logical sequence, form the backbone of the course and are required of every student. The supplementary subjects are filled in by each student according to his individual inclination and intellectual endowments. This does not mean that he can scatter all over the field and get only a superficial knowledge of engineering as a whole, but that he has a wide choice as to the field in which he chooses to concentrate. The result is that each student is not only encouraged, but actually compelled, to give thoughtful consideration to the end he has in view in being at M.I.T., and to the methods by which he can best attain this objective. This plan has been aided by putting the students' laboratory work onto a definitely investigatory basis so that each one does his laboratory work as his own (but carefully supervised) project.

By this process the Institute has made its very size a real advantage and not a hindrance to the student. In spite of the number of students enrolled at (Concluded on page 112)



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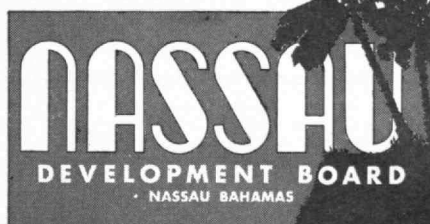
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EDUCATIONAL ADVANCES IN ELECTRICAL ENGINEERING

(Concluded from page 111)

M.I.T., I know of no educational institution where each student receives so much individual attention from the instructing staff, or where he gets into such intimate contact with so many instructors and administrative officers. The very fact that we have but 6.4 students per instructor is indicative of this condition.

The effort to concentrate on science and the modes of its application in electrical engineering, is aided further by co-operation with the industries, from which we draw each term distinguished and experienced young men to lead a number of colloquia. Each colloquium leader spends two successive afternoons in outlining rather intimately the qualities of his work, its relation to his company's affairs in general, the extent to which it exacts from him a use of scientific knowledge and scientific processes, the extent to which he is forced to rely on commercially obtained empirical knowledge because of incomplete scientific information, and the advantages that would accrue to his work if the gaps in scientific knowledge were filled. These colloquia are intended for the benefit of seniors and graduate students, and the colloquia attendants are encouraged to question the leader on all points of interest which arise within his subject. The result has been a livelier interest on the part of students in independent thinking about, and investigation of, science and its applications in electrical engineering.

It is a departmental policy of long standing to add several promising young engineering graduates to the staff each year. These young men are expected to remain about two years, and from their number permanent additions to the staff are made as occasions arise. The rest take positions in other colleges, or go into industry. To avoid inbreeding, and at the same time to carry on the traditions of the Department, approximately a 50-50 balance is maintained in the department personnel between M.I.T. graduates and graduates from other colleges. In order further to insure the steady infiltration of new ideas, and to prevent the staff from becoming smug or self-satisfied, there was approved by President Compton and inaugurated this year the policy of a systematic exchange of professors each year between M.I.T. departments and other engineering colleges. By this means the educational outlook of the members of the electrical engineering staff will be always extended beyond our own campus, and the Department will feel a constant stimulus of contact with other forward-looking engineering colleges. Members of the staff also possess many direct contacts with engineering practice which bring vitality into their teaching.

At the end of this school year Professor Jackson will have directed the policies of the Department for 28 years and will have reached the retiring age, and a new department head must carry on. But he will leave a staff thoroughly grounded in the fundamental principles which he has steadfastly maintained, deeply imbued with the spirit of pioneering and research, not only in the engineering field, but also in educational development. With this background, tradition, and training, the department will continue its progress and will be found "in line" tomorrow, as, we believe, it is today.

Mr. Sherman, the Department appreciates your kindly, constructive criticism. It values your advice and help, and the advice and help of every alumnus, in aiding it to carry out successfully its high purpose of developing in each student a strong character, high ideals, a worthy purpose, and a keen intellect, while stimulating and nurturing the spirit of pioneering, research, inventiveness, and that individualism which, in the last analysis, is the real genius of America.

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THE INSTITUTE GAZETTE

(Continued from page 106)

some very fine analyses of some of the most complicated spectra. (See page 101.)

Professor Harrison and J. C. Boyce's wave length measurements in the far ultraviolet. Each has a spectrograph far more sensitive than any others in this region, adding an extra decimal place to the possible accuracy of measurement, and since the instruments are different in every way, they can be checked against each other to verify the observed wave lengths. They agree with extraordinary precision. It should be pointed out that for the more complex spectra, extremely precise wave lengths are practically essential before any interpretation of the spectra can be made.

Third: Long-range research projects now in progress:

The high-voltage and nuclear program of Dr. Van de Graaff. Nuclear physics is rapidly coming to hold the center of interest, and the faster the high-voltage generator and vacuum tube are pushed, the sooner the Institute will be in position to undertake experimental work in this line. The large vacuum tube is still incomplete, but E. W. Samson has set up a small one in Cambridge. The staff is being strengthened in this field this year by the addition of Dr. Robley D. Evans, of California, a student of Dr. Robert A. Millikan.

Professor Harrison's spectroscopic program. This program has been largely devoted so far to the development of the laboratory and its equipment, though a few notable results, like Albertson's spectrum analyses,

have already been obtained. The principal fields of research now being worked on are the determination of standards in the far ultraviolet, photographing and analysis of line spectra of a number of atoms, principally in the iron group and the rare earths, intensities of lines in arcs, and hyperfine structure.

The electronics program of W. B. Nottingham and E. G. Rudberg. Nottingham's research is in the emission of electrons by metals, both photoelectrically and thermionically, particularly from coated surfaces. He is one of the very few experimenters making successful connection between the modern theories of the motion of electrons in metals and the experiments on emission. Professor Rudberg is interested in a related subject, the secondary electrons emitted by metals when bombarded by electrons, yielding essentially resonance potentials of the metal. This research has proceeded somewhat slowly on account of the labor of starting laboratory courses, but it is now proceeding satisfactorily.

A theoretical program of Assistant Professors Julius Stratton, '23, and Philip Morse. This deals with the solution of the mathematical problem of the wave equation in ellipsoidal coordinates, and solutions are being obtained both by analytical methods, and by the differential analyzer, tables of values being constructed. The importance of the problem lies in the number of applications which cannot be handled without the solution. These include radiation from an antenna, scattering of light by ellipsoidal particles, propagation of sound through a hyperbolic horn, diffraction of light through a circular aperture, scattering of electrons by a diatomic molecule.

(Continued on page 116)

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THE INSTITUTE GAZETTE

(Continued from page 114)

A theoretical program of Dr. J. C. Slater, dealing with the structure of metals, and of solids in general, according to the wave mechanics. This should provide material for improving the present treatments of thermionic and photoelectric emission, electrical conduction, and problems in the cohesion and elastic properties of metals.

It was pointed out in the ensuing discussion that the projects enumerated above were but a few of the more important ones in progress, and further that, although "there seemed to be a great diversity of topics, they could really all be grouped into five headings: spectroscopy, high-voltage research, electronics, crystal structure, theoretical physics.

The question was then raised for discussion: How could the research of the department be improved? It is recognized that, while excellent work has been already accomplished, and while the slow progress in other fields is amply explained by the fact that it is a new laboratory and some of the men have recently come, still there are possibilities of improvement. Would it be better to have fewer, more coördinated fields of research? Should the research be under closer direction? Should some fields be encouraged, others discouraged?

Professor Harlow Shapley commenced the discussion of whether a laboratory could not be too large for efficiency, so that it would take too much time from the director, and whether this was not perhaps an example. It was the general sentiment that probably a large laboratory took no more director's time in proportion to its size than a smaller one. Further, it was pointed out that the research in this laboratory was done largely by a number of rather autonomous groups, and that the director of each group was largely responsible for the research in his group, thus not burdening the director of the laboratory or head of the department. The question was raised whether five main groups of projects were not too many, if two or three would not be enough. This was answered by Dr. Compton, who pointed out that on account of the large amount of elementary teaching, the department was inevitably a large one, that it was not efficient to have more than a certain number of men on a single project, and that this rather inevitably led to a large number of projects. Further, Professor Harrison pointed out the desirability of having men in many

fields on hand, so that one could always consult an expert in any field which his own research touched on. Professor Richtmyer raised the question whether appointments were made with the research inclinations of the candidate in mind, and it was answered that they were, the object being to strengthen existing research fields rather than start new ones.

Dr. Coolidge raised the question whether it would be feasible to do as in Holland, dividing up research fields among different institutions, but it was concluded that this was hardly practicable in any general way, though it was pointed out by Professor Harrison that in definite research problems, as in spectroscopy, there were working arrangements with others in the field to avoid overlapping. The general question of coöperation of men in different fields was discussed, and its difficulties mentioned. Professor Richtmyer pointed out that in an institution like Cornell, where departments were in widely separated buildings, it was physically difficult to secure coöperation, but it was concluded that the Institute's experience showed that the real difficulties were temperamental, not geographical.

Professor Harrison raised what seemed to him the most serious example of lack of coöperation, that between the theoretical and experimental men, pointing out the difficulty of getting theoretical men to make the necessary calculations of spectral intensities to be of use to the experimentalist, though the theory was all worked out except for the last stages. He mentioned that there were a number of men around who could do it, but they were more interested in other things. This led to a discussion of how legitimate and how desirable it was to dictate to a graduate student or instructor what he should work on. Dr. Barton stated that when he was at Princeton it was Dr. Compton's custom to prescribe topics for research to the graduate students, and they as a rule became interested in the research. It was the general impression that it was better to prescribe topics of research rather than to leave the student to his own devices, and it was considered not unsuitable even to appoint an instructor on the basis of his doing prescribed research, the feeling being that academic freedom should be considered as something to be earned by several years of doing prescribed tasks.

There was a certain amount of discussion of applied physics, though not as much as of the other subjects. Dr. Coolidge introduced the subject by discussion of biophysics, and of mitogenetic radiation in particular, this being an illustration of a case where physicists were needed to settle a biological (Concluded on page 118)

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THE INSTITUTE GAZETTE

(Concluded from page 116)

question. It was his impression that there was a great future for the study of the relations between radiation and biology. Professor Harrison pointed out that the department was already engaged in several projects in that field. In the first place, he had designed and set up a water monochromator for the Biology Department, for the illumination of rats, to test the effects of different wave lengths. But more particularly, he described the plans for widening the scope of the summer conferences. In 1933 he held the first spectroscopic conference, devoted principally to the applications of spectroscopy to physics, chemistry, and industry. Last summer a similar conference was held, but with emphasis on biological aspects of spectroscopy, and a large number of biologists, physicians, and others were present. See the Review for October, page 21.

TOWARD A BROADER CURRICULUM

(Concluded from page 108)

modern world. Last year, in one of the Aldred lectures, Mr. E. A. Filene stressed the fact that this present-day civilization depends on fact-finding, possibly another name for science. Mr. Sherman, it seems to me, forgets that one of the best ways to achieve what he calls "a well-aroused individuality" is in the intense application which is necessary to solve one of the many research projects in progress at the Institute. I should say that the emphasis that is being placed on research is a very healthy sign. I think that Mr. Sherman is unaware of the stimulus which many members of the staff, consciously or unconsciously, give to "original thinking" on the part of a great many students.

Mr. Sherman feels that the chances for individual eminence for Technology graduates are not as bright as formerly. The answer to that question is largely one of emphasis. We have developed a huge industrial machine in this country. No longer, perhaps, need we pay so much attention to the production of new machines and processes. We do need men who are well-informed in the technics of our productive set-up, but who are also intelligently acquainted with the social aspects of their work. The need is evident for managers of high quality, managers who will realize that the chief need of the world is, in the words of Walter N. Polakov, famed consulting engineer, planning of "uninterrupted production and continuous consumption." Individual and group research carried on in a school like the Institute, may very well aid in rationalizing our industrial structure along the lines just suggested. Mr. Sherman points out that M.I.T. produced many of the men who built this industrial structure. May not the present Technology answer the question asked at the head of Mr. Sherman's letter — "Are the Colleges in Line Today?" — by producing men able to run the machine now that it is set up? Instead of worrying about technological unemployment, we should accept some of the criticisms of men like Mr. Sherman, change our curriculum and aim, if necessary, and make certain that Technology will be actively employed in making more certain the "more abundant life."

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RESULTS

As of November 10, 1934

Only 10.6 per cent. of the men awarded advanced degrees last June and 22.6 per cent. of those awarded bachelor degrees were unemployed.

As of November 10, 1933

The corresponding figures for the Class of 1933 were 24.3 per cent. and 35.8 per cent. respectively.

Watch this space in succeeding issues for information on the operation of the Placement Bureau. *✓ ✓ ✓ ✓* This Bureau is maintained by the Institute for the benefit of its alumni and industry.

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TECHNOLOGY MEN IN ACTION

CHECK-LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

Sons, Daughters, and Brothers

¶ The following sons, daughters, and brothers of administrative officers, members of the Faculty, and teaching staff are now students at the Institute: RALPH G. ADAMS, Jr.'38, son of Prof. R. G. Adams; ELINOR FAY '37, daughter of Prof. Richard Fay; LOUIS J. GILLESPIE, Jr.'35, son of Prof. L. J. Gillespie; LESLIE G. HAINES '35, son of Coach William Haines; MURRAY H. HAYWARD '38, son of Prof. Carle Hayward; STANLEY T. JOHNSON '36, son of Sanfrid K. Johnson; CLAY LEWIS and W. K. LEWIS, Jr., graduates, sons of Prof. W. K. Lewis; HENRY C. MABIE '36, son of Prof. C. H. R. Mabie; CLARK S. ROBINSON, Jr.'38, son of Prof. Clark Robinson; PAUL E. SMITH '36, brother of Prof. Richard H. Smith; PRESCOTT A. SMITH '35, son of the late Prof. Robert H. Smith; WALTER SQUIRES '36, brother of Lombard Squires; THEODORE R. TIMBIE '37, son of Prof. W. H. Timbie; GORDON B. WILKES, Jr.'37, son of Prof. G. B. Wilkes; ROBERT D. WILLIAMS, graduate, son of Prof. R. S. Williams.

The Technology duPonts

¶ Since 1876, an imposing number of duPonts (15 in all; 12 now living) have been educated at M.I.T. The most recent graduate was PIERRE S., 3rd, Class of '33, and there is an undergraduate, WILLIAM BAYARD, '36, carrying on the tradition.

In the News

¶ KARL T. COMPTON, for an address at the 20th anniversary dinner of the Engineering Foundation, held in New York in honor of Ambrose Swasey, who established the Foundation. "Either government support or private endowments by men of wealth must foster the work of progress which is being made through science and the educational agencies," Dr. Compton said. "There are few modern influences so important to human welfare as foundations. These altruistic organizations are a characteristically American development. There are now 29 important foundations, with a total endowment of over \$800,000,000, in the country, and to them we must look for some of the most important

contributions to our civilization. FRANK B. JEWETT '03, Vice-President of the American Telephone Company, declared that religion, institutions of learning, and foundations like the Engineering Foundation comprise three of the most vital forces in modern culture. HARRY P. CHARLESWORTH '05, Chairman of the Engineering Foundation, presented to Mr. Swasey a volume containing expressions of felicitation and gratitude in behalf of the various organizations comprising the Foundation.

¶ VANNEVAR BUSH '16, as one of the speakers at the inauguration of PORTER ADAMS '14 as President of Norwich University, on October 22. Dean A. FALES '14, H. B. RICHMOND '14, Dean H. E. LOBDELL '17, and ALLAN W. ROWE '01 (trustee of Norwich) attended as delegates.

¶ CHARLES R. ALLEN '85, on his retirement from Government service as consultant for vocational education of the Federal Office of Education. A pioneer in this field, his work in organizing the New Bedford Independent Industrial School in the face of heavy opposition won him nation-wide recognition. During the War he was assistant superintendent of training of the Emergency Fleet Corporation, a position in which he rendered distinctive service.

¶ ALFRED P. SLOAN, Jr. '95, President of General Motors, for his opinion on "collective bargaining as a constructive step forward." The statement says: "It must be made clear that collective bargaining does not imply the assumption by the employee of a voice in those affairs of management which management, by its very nature, must ultimately decide upon its own responsibility. It does not mean collective employer-employee management and must be limited to employer-employee relationships."

¶ EDWIN E. ALDRIN '17, head of the Aviation Department of the Standard Oil Company of N. J., who was awarded the decoration of the Comendatore of the Crown of Italy on his recent trip abroad, on being elected a fellow of the Institute of the Aeronautical Sciences, of which he is also Treasurer. New fellows are elected by the previously elected fellows and only ten may be elected in any one year.

Written

¶ About HORACE S. FORD, account of his work as Bursar of M.I.T., in an article by William Berchtold, "Men of College Dollars," in the *New Outlook* for September.

¶ By Professors CHARLES B. BREED '97 and GEORGE L. HOSMER '97, both of M.I.T., a book entitled "Principles and Practice of Surveying," in July.

¶ By JOHN A. ALLAN '12 and RALPH L. RUTHERFORD '21, a book on "Geology of Central Alberta," published by JOHN A. ALLAN, Director of Geological Survey Division, Alberta.

¶ By DOUGLAS C. MCMURTRIE '15, an article in the October issue of *The Rotarian*, entitled "Civilization Follows the Press."

¶ By EDWARD R. SCHWARZ '23, a paper on "The Importance of Interpretation to the Industry of Textile Research," presented at the Fifth Annual Meeting of the U. S. Institute for Textile Research in New York, November 1. He will also speak on "The New Textile Technology" at the Annual Meeting of the American Association of Textile Chemists and Colorists, to be held in December in New York.

¶ By Prof. CHARLES W. BERRY '95, CARL L. SVENSON '19, and H. CARLTON MOORE '24, a book, "Problems in Engineering Thermodynamics and Heat Engineering," in September.

DEATHS

*See class notes for account.

- ¶ HAZEN J. BURTON '70, Sept. 21.
- ¶ HIRAM W. BLAISDELL '73, May 11.
- ¶ HENRY H. CARTER '77*, Oct. 4.
- ¶ FREDERIC P. SPALDING '77, Oct. 29.
- ¶ GEORGE W. HAMILTON '80, Apr. 6.
- ¶ FRANK E. DAVIS '83, Aug. 30.
- ¶ HIRAM G. HAMMETT '84, Sept. 22.
- ¶ HERBERT V. HILDRETH '85, Sept. 8.
- ¶ FRANK C. GODDARD '86, Jan. 6.
- ¶ SAMUEL P. MULLIKEN '87, Oct. 24. (See Institute Gazette.)
- ¶ RICHARD HOOKER '89, Oct. 24.
- ¶ VICTOR RAY '89, Oct. 25.
- ¶ ADELAIDE BIRD '91, Oct. 20.
- ¶ CHARLES MORRIS '96, Oct. 13.
- ¶ J. LAWRENCE GILSON '03, Oct. 4.
- ¶ WILLIAM H. LANGE '12, Aug. 3.
- ¶ NELSON T. MANN '23, Feb. 17.
- ¶ LAURENCE T. TUFTS '29, Sept. 28.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Technology Club of Rochester

Thirty-two members of the Technology Club of Rochester attended an enjoyable gathering at the home of the President, William W. Vicinus '23, at the Highlands in Durand-Eastman Park, Rochester, on September 29. A short, but hotly contested, baseball game was played between representatives of the odd and even classes. The host has long been famous for the regal manner in which he has entertained the Club in the past, and the dinner of steamed clams (straight from Boston) and broiled chicken exceeded all previous records of hospitality.

The following new members were elected: Howard F. Carver '32, E. Philip Kron '34, David L. Babcock '33, Benjamin C. Hiatt '33, Frazer D. Punnett '34, H. Everest Clements '32. It was announced that the Club's Annual \$500 Freshman Scholarship at M.I.T. had been awarded to Frederick J. Kolb '38, of Rochester. The report of the Scholarship Committee and an account of its operations over the past seven years was favorably received by the Club, and it was voted that the work be continued. The Club also acted favorably on its annual contribution of \$50 to the Alumni Athletic Fund of the M.I.T.A.A.

The following officers were unanimously elected for 1934-35: President, Donald B. Webster '16; 1st Vice-President, Hazen C. Pratt '22; 2nd Vice-President, Andrew Langdon '22; Secretary, Richard M. Wilson '30; Treasurer, Francis B. Thorne '27; Executive Committee, John F. Ancona '03 (1934-37). Continuing Members of the Executive Committee are: Edward S. Farrow '20 (1933-36), Walter T. Keen '04 (1933-35).

At the sudden news of the death of Laurence T. Tufts '29, a former secretary of the Club, it was moved and passed that the Secretary express the sympathy of the Club to the parents of Mr. Tufts.

Following a vote of thanks to the retiring officers for their efforts in behalf of the Club during the year, the meeting was adjourned. — HOWARD S. GARDNER, Jr., '30, Retiring Secretary, Building No. 46, Kodak Park, Rochester, N. Y.

Technology Club of Central Pennsylvania

The Club held the first meeting of the season on Friday, October 19, at the Yorktowne Hotel in York, Pa. We were very fortunate in securing as our guest of honor for this occasion Dr. Karl T. Compton, President of M.I.T.

All records for attendance at our meetings were broken when 42 members and guests turned out to meet Dr. Compton

and to hear from him of the many interesting things being done at the Institute. After a delightful meal, during which many old acquaintances were renewed, our genial President, L. S. Morse '96, acting as toastmaster, introduced the Honorable H. C. Niles, the leading member of the Bench in York. Judge Niles gave the official welcome of York to Dr. Compton and very amusingly catalogued the outstanding features of that city, although he intimated that the extreme modesty characteristic of York, and particularly of its Chamber of Commerce, prevented him from painting an adequate picture of its preëminence. The next speaker was W. S. Shipley, President of the York Ice Machinery Corporation. Mr. Shipley's company has been employing Tech graduates for many years and has now about 30 employed in various capacities. It was, therefore, with considerable interest that we listened to Mr. Shipley's brief exposition of the "Need for Properly Trained Men in Industry" and the methods used by his company in filling his need.

Dr. Compton was then introduced and in his inimitable way covered the present situation at the Institute. We were particularly interested in his lucid description of some of the research work being done there. The fog dissipator of H. G. Houghton '27 was very interesting and appears to be the answer to making blind flying safe. The static generator of Van de Graaff was, of course, more or less familiar to us, but Dr. Compton's explanation of the apparatus and some of the problems which are being overcome in developing a tube for use with it were new. Particularly interesting in this respect was his description of the vacuum tube transmission system for electric power and the possibility that static generators similar to Van de Graaff's may have an important field in the future generation and transmission of power.

The many other important researches being carried on at the Institute as covered by Dr. Compton give ample proof that M.I.T. is maintaining its preëminent position as a scientific institution. The excellence of the personnel being added to the staff ensures its place as an educational leader, and as those present at the meeting will agree, the personality and scientific achievement of President Compton lend security to the belief that all is well and will remain so within our Alma Mater. This, the most successful meeting of the Club's history, closed with the showing of the new and spectacular Edgerton high-speed movie.

Among those present were the following alumni: A. A. Berestneff '33, R. L. Bowles '24, L. O. Buckner '21, Ellery D. Clark '33, J. P. Connelly '28, M. W. Davidson '26, Laurence De Fabritis '29, F. G. Dempwolf '07, W. S. Galazzi '32,

Farley Gannett '02, J. R. Henderson '34, A. L. Hesselschwerdt '31, W. P. Hinckley '26, R. D. Hoak '28, N. E. Hopkins '33, C. K. Miller '23, E. J. Mink '22, L. S. Morse '96, L. S. Morse, Jr. '31, Emil Neubauer '33, A. B. Newton '32, A. W. Ruff '26, A. J. Seiler '32, J. B. Shea '31, B. J. Stevens '23, O. S. Stockman '01, Frank A. Thas '28, C. J. Walton '14, S. A. Whitt '34, R. G. Wyld '24. — M. W. DAVIDSON '26, Secretary, Bell Telephone Co., 210 Pine Street, Harrisburg, Pa.

Atlanta Alumni Association of the M.I.T.

It always takes at least one alumni member with sustained enthusiasm to hold a small group together over a period of years, and in the case of the Atlanta Club it is none other than Charles A. Smith '99. Other members and successive officers have made welcome contributions, but it is to Charlie that the club looks each year to put the program over.

The Club had the pleasure of having Dr. Tryon at a dinner held at the Atlanta Athletic Club. Everyone enjoyed the films and the exposition of them by Dr. Tryon. On the same occasion, Professor T. E. Moody '24, Professor of Aeronautics at Georgia Tech, ran a short film demonstrating his most amazing invention "The Roadoplane." This purports to be a true example of air-flow principles and has very distinct advantages over the present type on the market.

A convivial banquet was held during the winter at the East Lake Golf and Country Club at which the following officers were elected: Lawrie H. Turner '99, President; Sam H. Reynolds '22, Secretary. — The occasional baked bean dinners held at the various homes last year were thoroughly enjoyed and will be continued indefinitely. Extensive research has been made to see that the beans are really baked in the Boston style. — The Club takes particular pride in the recent achievement of the firm of Edwards and Sayward (W. J. Sayward '01) who were awarded the contract for the much publicized Federal Housing Plan in Atlanta. This is one of the first low-cost housing projects started by the Government and calls for an expenditure of \$1,600,000. — We meet the first Tuesday of each month at 12:30 for luncheon at the Atlanta Athletic Club. Any Tech man visiting is invited to drop in. — SAM H. REYNOLDS '22, Secretary, Crucible Steel Company of America, Atlanta, Ga.

Indiana Association of the M.I.T.

The recent visit of Dean Prescott of Indianapolis in connection with the dedication of the new Eli Lilly and

Company Laboratories, provided a fitting opportunity for this season's first meeting of the Club. We met with Dean Prescott at dinner at the Indianapolis Athletic Club, Friday night, October 12, and considering the shortness of the notice, had a good turnout with 11 present, including Professor John A. Sauers and Major Haskin, who came down from Purdue University, Lafayette, Ind.

After an enjoyable meal, Dean Prescott talked informally about conditions at the Institute, especially in regard to dormitory life and the excellent spirit which it engenders; about the new track house; changes in course, and so on. — E. M. McNALLY '18, *Secretary*, The Barbasol Company, P. O. Box 1178, Indianapolis, Ind.

Washington Society of the M.I.T.

The first regular luncheon meeting of the Society was held on Friday, October 19, at 12:45 P.M. at the University Club. Our speaker, Mr. Robert L. O'Brien, Chairman of the United States Tariff Commission, gave us an unusually interesting talk on "The Present Economic Outlook" and outlined the progress we are making in overcoming the depression.

Fifty-eight old members, new members, and guests turned out for the meeting. Although this is a near-record turnout, we hope to garner even more into the fold next month.

Among those present were: Marcy L. Sperry '00, E. J. Boothby, W. K. MacMahon '22, G. R. Williams '29, S. Ben-singer '31, E. H. Lloyd '33, R. Ilsley '25, F. W. Willcutt '27, N. D. Fitzgerald '31, E. J. Sax '27, L. Teplon '26, A. Pope '07, P. L. Dougherty '97, H. W. Tyler '84, K. C. Reynolds '25, A. M. Holcombe '04, R. L. O'Brien '18, W. H. Martin '07, W. E. O'Brien, E. T. Steel '06, A. P. Bruce '33, O. J. Tibert, F. M. Moss '32, R. S. Buck, F. H. Holden '94, G. W. Fields, D. C. Coyle, C. P. Kerr '11, A. E. Hanson '14, N. C. Emerson '04, C. E. Brokaw '22, F. A. Hunnewell '97, R. W. Morse '05, M. Boyle '98, A. S. Buyers '23, F. P. McKibben '94, F. E. Matthes '95, B. F. Thomas, Jr. '13, A. L. Sherman '06, K. H. Tattow, J. T. Cheney '03, H. Crosby '03, E. W. Ritchie '98, J. A. Larrivee '30, L. J. Grayson '19, F. L. Tobin '22, C. H. Deetz '89, W. E. Parker '99, D. J. Guy '12, F. E. Towle '94, A. B. McDaniel '01, W. I. Swanton '93. — EDMUND H. LLOYD '33, *Assistant Secretary*, 3736 Kanawha Street, N. W., Washington, D. C.

The M.I.T. Club of Western Pennsylvania

On Friday, September 28, the Club held a golf and dinner meeting at the Field Club, near Pittsburgh. The minutes of this meeting must perforce be somewhat apologetic, for the first meeting of the season is, as usual, not very serious in nature. Just how little gravity was in evidence is shown by the fact that the meeting was held in the bar of the Field

Club, where liquid refreshments were served before and after the dinner. A few of the more wayward members subsequently engaged in a game of chance — for the purpose of showing that the probability theory still holds. The Secretary is sadly convinced that it does.

Our aviation-minded President, John T. Nichols '22, practically dropped into the meeting, arriving here from Chicago in three hours, just in time to attend. The second long-distance prize goes to Mr. Arnold, who traveled all the way up from Wheeling. The meeting was adjourned when it was discovered that we were keeping the Field Club from closing for the day. — E. J. CASSELMAN '15, *Assistant Secretary*, Mellon Institute, Pittsburgh, Pa.

CLASS NOTES

1875

Classmates may be interested to know that at last Almon C. Libby has been heard from. In some mysterious way the Alumni Association procured his address in Flint, Mich., and sent it to your Secretary. He immediately wrote to Libby a plea for information as to his career for the class archives. Hammatt's directory of 1926, the last one he compiled and probably the last one ever to be published, states of Libby "not heard from since 1885." Well, considering that that date is nearly 50 years ago, the recent receipt of a letter of three closely typed pages from him giving the salient points of his life naturally was very gratifying and gave your Secretary much pleasure. He would like to publish extracts from this letter but space forbids.

Suffice it to say that Libby spent most of his life in his chosen profession, civil engineering, railroads, hydraulics, and irrigation, mostly in the far West. He retired some years ago. He is 85 years old, enjoys good health, can walk his three or four miles a day with ease, and is pleasantly situated in Flint. Long life to Libby!

The Secretary would like to fill in some more of the missing links. — THOMAS HIBBARD, *Secretary*, 4 Ridge Road, Milton, Mass.

1877

On the eve of his 77th birthday, on October 4, Henry Hall Carter, youngest graduate of the class, died at his home, 195 St. Paul Street, Brookline, Mass. He was buried in Mt. Auburn Cemetery, Cambridge, bringing to a close an active and successful career as a civil engineer; leaving a record of work well done; a reputation for squareness and efficiency which would be difficult to duplicate; and the sacred heritage of a host of admiring friends whose tribute will ever be "that it was a privilege to have touched shoulders with a man of this character."

Born October 5, 1857, at 2 Spruce Street, Beacon Hill, the son of Henry Carter of Putney, Vt., and Eunice (Gorham) Carter, Henry Carter was educated in the Boston schools, and throughout his life

was intensely interested in his local city, although he traveled extensively in all parts of the world. After graduation from M.I.T. and continuing until 1883, Mr. Carter was connected with the Boston Main Drainage Works in various engineering positions on tunnels, sewers, pumping stations, and outlet works, including the works at Moon Island. From 1883-1887 he was employed as engineer for the Boston Water Works, taking charge of the construction of the Farm Pond Conduit in South Framingham. For more than a year of this period he was engaged in making surveys for the full development of the water supply for the Sudbury River and located the site of Hopkinton and other reservoirs for the City of Boston. He was chief engineer of the Boston Sewer Department from 1887-1889 and was also chief engineer of the Stony Brook Improvement, and had charge of the work. In 1891 Mr. Carter was appointed Superintendent of Streets of the City of Boston and had charge of paving, sewer, street cleaning, sanitary, and bridge division. He was also Commissioner for the Harvard and Cambridge Bridge. Resigning as superintendent in 1894, he was appointed consulting engineer of the Boston Transit Commission, West End Street Railway, and other corporations, doing general consulting engineering business for the Metropolitan Construction Company and others in connection with contracting work. Two years later Mr. Carter gave up active public work to engage in business with the late Charles L. Perrin under the firm name of the Metropolitan Contracting Company, of which Mr. Carter became President. This firm had a part in many important engineering projects. He was also engaged in the construction of heavy foundations at East Boston and the many public work contracts which were completed in a great many of the large cities of the country under the guidance of Mr. Carter placed him among the pioneer subway and tunnel builders of this section of the country and earned for him the title of a master in his chosen field.

As an expert, Mr. Carter testified in many important cases and because of his earnest and convincing manner, a clear presentation of established facts prepared in a logical and able mind, he rarely lost a case for his client. Although not a member of the legal profession, he usually handled his own cases without assistance, and at a hearing in Washington, D. C., before the Interstate Commerce Commission, he received most favorable comments for the manner in which he conducted his case against an array of able lawyers employed by a railroad company.

For the past 25 years of his life, Mr. Carter had been retired from active business, traveling in foreign countries, as well as in his own, spending many winters in Honolulu, summers in Maine, in and on the sea. A lover of fishing (and his fish stories were always backed by photographic evidence), sailing, and duck shooting, he set aside a period of each year for these enjoyments, spending several

1877 Continued

weeks of each fall in his Saskatchewan shooting camp. A few years ago, Mr. and Mrs. Carter were members of a party who made a five months' cruise around the world on the *Resolute*, accompanied by five other M.I.T. alumni. With a mind always alert to current issues, he submitted editorials and wrote various papers relating to professional work in the *Journal* of the Association of Engineering Societies, and not infrequently made charts and maps of property which have been of value to clubs and to the Government.

Although affiliated with many clubs and associations, Mr. Carter always retained his membership with the American Society of Civil Engineers, the Boston Society of Civil Engineers, the Boston Art Club, the Calumet Club of New York and the Santee Shooting Club at Santee, S. C., and was a member of the Society of Mayflower Descendants. He is survived by his widow, Mrs. Adelaide A. Carter, and a sister, Mrs. Horace Williams Fuller, both of Brookline.

The last social function Mr. Carter attended was the '77 class reunion in June. Although he was unable to stay for the entire afternoon, it gave him much pleasure to meet "with the boys" on that occasion.

A leader, yet interested in those who followed him, Mr. Carter commanded the respect and the admiration of all. And so passes a distinguished man, an honor to his Alma Mater, and a credit to himself, who in his love for the sea, the woods, and his home reminds us: "Home is the sailor, home from sea; and the hunter home from the hill." We are indebted to Mrs. Richard D. Chase, secretary to the late Mr. Carter, for the above account which she prepared and sent to the Secretary. — BELVIN T. WILLISTON, Secretary, 3 Monmouth Street, Somerville, Mass.

1883

A recent newspaper carried the following notice on the death of Joseph Plumb: "Joseph Dart Plumb of New York, a pioneer writer of real estate advertising, died Tuesday (August 28) after a week's illness. . . . Mr. Plumb, who was born in Boston, was a son of Rev. Albert Hale Plumb, D.D., a well-known Congregational minister a generation ago, who was pastor of what was then the Walnut Avenue Congregational Church; and he was tenth in the line of descent from Governor William Bradford of Massachusetts. He was graduated from the M.I.T., after which he studied art in Paris, specializing in portraiture and illustration.

"In 1889 Mr. Plumb became associated with Wood Harmon and Company of Boston, who were among the first to develop suburban realty for residential purposes. Mr. Plumb had charge of their advertising and was active in the vicinity of Boston and later in other places.

"About ten years ago Mr. Plumb moved to New York City. He had conducted a real estate course in the extension department of Columbia University and had written extensively on real estate topics for different publications. For the last

two years he had been doing work in connection with physical education for the research department of New York University."

The Secretary attended the annual convention of the American Institute of Accountants at Hotel Stevens in Chicago, October 14 to 19, and took part in discussions on the New Deal, taxation, accountancy, and so on. — HARVEY S. CHASE, Secretary, Bridge Street, South Hamilton, Mass.

1885

The Fiftieth Anniversary of the Class will be held at the Holiday House, Wellfleet, Mass., on Thursday, Friday, Saturday, and Sunday, June 21, 22, 23, and 24, 1935, by ukase of the brain trust, the President, Treasurer, and Secretary. Last June these three dignitaries, with Alex McKim for ballast, motored to Wellfleet at the invitation of Dave Baker, whose ancestors settled there, and where Dave and Mrs. Baker occupy the family homestead during the summer. Wellfleet is a picturesque little hamlet located at the great-toe joint of Cape Cod, 12 miles from Provincetown and 100 miles from Boston by motor. The Provincetown boat arrives at that port about noon, where there will be conveyances for Wellfleet each day, and the train from Boston gets to Wellfleet about the same time.

The celebration will begin with luncheon on Thursday and will end after luncheon on Sunday, in time to make either boat or train for Boston. For those who would prefer the motor trip, there will be ample accommodations on the first day and probably on Friday as well. The hotel embraces five separate buildings bearing the mark of the old-time hospitality that still lingers over this unspoiled part of the Cape. It is ample and invitingly comfortable, with modern conveniences, a few minutes from the bathing beach in a cool, shady retreat. It goes without saying that those who like sea food will have the gustatory time of their lives as the fish, lobsters, oysters, and clams which we are to enjoy, are now sporting in their babyhood within a few hundred yards of the locality where their human sarcophagi will await them next June. Mr. and Mrs. Price, who will be our hosts, are eager to cater to the whims of each individual guest; breakfast in bed if you want it, diabetic food for any sugar refineries who may attend, and the syrup on your cakes will be applied either criss-cross or wiggle woggle as you may desire, if you are too feeble to manipulate it yourself. Get the spirit? Oh, yes, that will also be taken care of.

You may perhaps remember that Dave Baker was instrumental in establishing the country club at Wellfleet with its most unusual golf course, which will be ours to command. All around the town are picturesque little lakes reached by woodland paths or motor, and they abound with game fish. The town is on the bay side, but it is only a short distance from the open ocean on the east, where are power boats equipped for salt water fishing. Then there are the interesting

features of Provincetown, within a half-hour ride, Highland Light at Truro, the largest lighthouse on the Atlantic Coast, and the Cahoon Life Saving Station at Wellfleet, where the crew will give us an exhibition boat drill and we can see how they live and the apparatus for saving life at sea. But the thing of most interest is the quaint old town itself with the atmosphere and relics of the past and the comforts and conveniences of the present. And then there are Mr. and Mrs. Dave with open arms!

Paste the date on the clock and keep well and hearty until June 21, 1935!

The class is expected to be present at the Commencement exercises in Cambridge, early in June, and in the afternoon of the same day it is the custom of the President to have a reception for the anniversary class. The event we most anticipate is the get-together on the Cape, and in order to be sure of genial weather, this date was made as late in June as possible; and at the same time have the hotel all to ourselves. Accordingly, we shall not attempt to inveigle our more distant brothers to attend the formal exercises at the Institute, but we hope for the presence of every one near Boston so that we may make as good a showing as possible.

The 49th annual meeting of the Class was held at the Exchange Club, Boston, May 17. Some one had the happy thought of a noon dinner and as a result about 25 were present. Alex McKim, who had recently returned after living in Germany for several years, gave us a graphic picture of that country as well as the customs of student dueling, an art of which he was a renowned master during his post-graduate student days in that country. Arthur Doane, who has been in Wyoming almost from the time of graduation, was present and received a warm welcome back to the fold. Bert Pratt, who was our first President, was elected to see us through, and will preside with parliamentary austerity at the formal Wellfleet deliberations. Ed Dewson is the hereditary Treasurer and the class officers were directed to arrange for the place, time, and program of the 50th anniversary.

The following appeared in a recent newspaper: "A bequest of \$1,000 to the M.I.T. in memory of his brother, Charles W. Eaton, and 'in recognition of the generosity and kindly interest manifested toward me,' was made in the will of Edward O. Eaton of Haverhill. . . . Charles Eaton was one of the most loyal of Technology benefactors, giving the Institute more than \$200,000 during his life. A large part of this money was used in the Technology summer camp at East Machias, Maine." Charlie was the leading spirit and largest giver to the \$5,000 fund for the '85 flag pole, one of the two in the Great Court. The bronze base was by Tiffany.

From a recent copy of the New York Times we clip the following: "The South's trouble is due primarily to three causes: excessive exploitation from the outside, the habit of buying from other sections things which should be pro-

1885 Continued

duced at home, and an obsolete agricultural system, according to Hugh McRae of Wilmington, President of the South-eastern Council."

George Nye, city engineer of New Bedford, has made an enviable reputation during his term as chairman of the Massachusetts Federation of Planning Boards. — Earlier in the year a hearty letter from our beloved Chippy Chapman, "first lieutenant and adjutant," spoke of his hope to be able to make the grade from his mountain top in Arizona, for the 50th. God grant that he can. He was the go-wheel of the last reunion at Wianno. — C. M. Welder's address is now Box 246, Daytona Beach, Fla.

Dewson, Plaisted, and the Secretary motored to Salem in October and made a visitation on Mr. and Mrs. Charlie Brown. Charles is having his pink shirt laundered and his flowing moustache marceled against a big run of trade next June at Wellfleet. — Jim Kimball and Alex McKim are together for the winter in Miami, Fla. Their address is Suite 1, N.E. Fifth Street. — Charles Bartlett is living at 9 Garden Street, Milford, N. H. He writes that he is out and about a little after a period of ten months in bed. — Mr. and Mrs. Arthur Little spent the summer in the Italian lake country.

It is with deep regret that we have to record the sudden deaths of two classmates: H. V. Hildreth passed away suddenly September 8 at his home at Westford, Mass., and Harry Barr at Essen Junction, Vt., on May 5. At this writing we have no particulars of either event. Hildreth's loss will be keenly felt. He could always be counted on for anything that would further the interest of '85, and few, if any, members have a better record of attendance at class doings. — Harry Barr has been lost to us for many years. All efforts of the Secretary failed. Through the tireless efforts of Mr. Buttolph, Vice-President of the Manufacturers Fire Insurance Company of Rhode Island, his widow was located in Burlington, Vt., some time after Harry's death. He left a widow and twins, two years old. — ISAAC W. LITCHFIELD, *Secretary*, 165 Winchester Street, Brookline, Mass.

1887

The Secretary is indebted to Winthrop Cole for the major portion of the class news for the current issue of *The Technology Review*. On a recent motor trip through Connecticut, Cole stopped in Waterbury and spent a very pleasant evening with Ed Goss and his family. He also reports that while in Schenectady last month he made a call on H. D. Sears, whom he found recuperating from a severe illness, though apparently well on the road to recovery.

John L. Shortall, one of the trustees of the Class Fund, and always one of the foremost in the activities of the class, passed away in Chicago on September 9 at the age of 69, after a long illness. Shortall was graduated from St. Paul's School in Concord, N. H., and after graduation from M.I.T. entered the investment banking business at Lake

Preston, S. D., and later studied law, being admitted to the Illinois bar in 1891. For a number of years he headed the Humane Society, and devoted a large portion of his time to the welfare of children and animals. During the World War he served as Chairman of the Chicago Board of Exemption. He is survived by his widow and four children. He was a member of the American, Illinois, and Chicago Bar Associations, the Chicago Law Institute, the University Club, the Huron Mountain Club in northern Michigan, the Chicago Historical Society, Art Institute, and the Field Museum.

The Secretary has just read the sad news of the passing of Samuel P. Mulliken, one of '87's most distinguished members. A sketch of his life will be given in the next issue. — NATHANIEL T. VERY, *Secretary*, 14 Currier Road, Lynn, Mass.

1888

Teddy Foque after 45 years of railroad service, all on one road, the "Soo Line," retired from active business on July 1, 1933, and his present mailing address is Wayzata, Minn. This is all we are allowed to publish from a very interesting letter just received from Foque. However, from our class records we find that Foque lived in Malden while attending Technology, and if our memory serves us correctly, he won second prize, next to Billy Keough, in the Freshman Drill. Late in the summer of '88 he went to Minneapolis and entered the service of the Minneapolis, St. Paul, and Sault Ste. Marie Railway Company as draughtsman and rose steadily to General Mechanical Superintendent in 1918, which office he held till his retirement. He is a member of many clubs, of the Advisory Committee of the First National Bank of Minneapolis, and Director of Midland Lumber and Coal Company. After reading the above, not in his letter, he will undoubtedly relent and allow me to tell his classmates, who have not heard from him for years, that he is now living in his own year-around home at Lake Minnetonka, 12 miles from town, as he prefers suburban life. Who doesn't? Many happy years in your new home is the wish of your New England classmates and may we see you at our 50th.

Francis L. V. Hoppin, IV, our class artist and illustrator and noted New York architect, is now making his home at the Union Club, Park Avenue and 69th Street, New York City.

Harry Horn, Major, retired U.S.A., late General Manager Northern Pacific Railroad, Past President Alumni Association M.I.T., now resides at 1791 Beacon Street, Brookline, Mass. May his shadow and grandchildren never grow less. — President Alfred H. Sawyer occupied his summer residence at Plymouth during part of July and August. — Walter K. Shaw, Jr., is Chairman of the Concord Republican Town Committee.

Another ideal has been shattered. In stead of 365 islands in Casco Bay, Maine, there are only 186 by the Secretary's actual count (on the chart). This count

however brought out competition with John Runkle's famous list of "English Taverns at which I have Stopped" published in *The Review* last year. As 31 members of the Class passed among these islands on their way from Portland to Chebeague Island at the time of our Fortieth Reunion there in 1928, the Secretary thinks it is at least due them to know some of the names of these islands, although they did not see them on account of the fog which occasionally visits Casco Bay at inopportune times. These names follow: Brown Cow, White Bull, Horse, Great Hog, Little Hog, Sheep, Big Hen, Goose and Goslings, Sow and Pigs, Hen and Chickens, House, Cat, Dog's Head, Ram, Little Bull, The Hussey, Ministerial, Pumpkin Nob, Crow, Eagle, The Brothers, Sisters, Bald Head, Burnt Coat, Blacksnake, Rogue, Bombazine, Uncle Zeke, Turnip, Whaleboat, Irony, Thrumb Cap, Crab, Goose Nest, Stepping Stones, Junk of Pork, and Pound of Tea. Is it any wonder your Secretary feels at home among these islands which he first visited during his freshman vacation nearly 50 years ago? — BERTRAND R. T. COLLINS, *Secretary*, 52 Garden Street, Cambridge, Mass.

1889

The Boston *Herald* of September 29 last, carried the following notice regarding Sauveur: "Dr. Albert Sauveur, Gordon McKay Professor of Mining and Metallurgy at Harvard University, has been awarded the New Achievement medal of the American Society for Metals. Presentation of the medal will be made Thursday, October 4, at the Hotel Pennsylvania, New York City, where the society's annual banquet is to be held. This is the first award of the medal, which was established a month ago to be awarded in recognition of metallurgical achievement which has stimulated work along similar lines and contributed to advance in metallurgical knowledge. In tribute to Dr. Sauveur, the first recipient, the medal will henceforth be known as the Albert Sauveur Achievement Medal and will be awarded annually. Dr. Sauveur was graduated from the M.I.T. in 1889, receiving doctorates from the Case School of Applied Science, the University of Grenoble, the University of San Marcos, and Lehigh University. He has been associated with Harvard since 1889, becoming a professor in 1905 and being Gordon McKay Professor since 1924. He is a fellow of the American Academy of Arts and Sciences and the American Association for the Advancement of Science, and a member of the National Academy of Sciences as well as many other similar organizations. He has previously been awarded numerous medals for his work."

The Boston *Traveler* referred to Hobbs' celebration of his 66th birthday on September 24 as follows: "Franklin W. Hobbs, well-known in the textile world, and former President of the National Association of Woolen Manufacturers, today celebrated his 66th birthday. He was born in Roxbury in 1868 and had his early schooling in this city. In 1889, he

1889 Continued

was graduated from the M.I.T. and was an instructor of mechanical engineering there for the next two years. In 1891 he went to England and studied for a year at the Bradford Technology College. After a year abroad, he returned to this country and the next year married. He became associated with the Arlington Mills and is now President of the company. In 1913 he was awarded the honorary degree of master of science by Dartmouth College. Since he first became connected with the Arlington Mills, Mr. Hobbs has been a leading figure in the textile world. He has been the President of the National Association of Woolen Manufacturers and also President of the National Association of Cotton Manufacturers, the only man ever to have held both positions. He resigned from the former last year when the code went into effect and is now Vice-President of the Association."

Kaludy Spaulding died at Framingham, Mass., on September 20 in his 69th year. The Secretary hopes to obtain details of Kaludy's life for publication in the next issue of The Review.

The death, on September 7, of Thomas R. Kimball, who took a special course in architecture, removes one of the most picturesque figures among Tech Alumni. His family lived in Omaha and his father was one of the early officials of the Union Pacific Railroad. Kimball's early life was spent in Omaha and on the Nebraska plains, and the Secretary recalls his accounts of the meetings with the Sioux Indians, sometimes when their intentions appeared to be more than doubtful. Kimball was one of the most prominent architects in the country and had been President of the American Institute of Architects.

The following account of Kimball's life appeared in an Omaha paper: "Thomas R. Kimball, pioneer Omahan and nationally known architect, died after a long illness. He was 72 and had lived in Omaha 57 years. Mr. Kimball's death followed by three days that of his sister, Mrs. George W. Holdrege, who died here Tuesday. Mr. Kimball, born in Cincinnati, came to Omaha at an early age. His father, the late Thomas L. Kimball, was a Vice-President of the Union Pacific Railroad. After studying at the University of Nebraska, Mr. Kimball attended the M.I.T., the Cowles Art School in Boston, and later studied with Harpignien in Paris. He was awarded a scholarship by the Boston Society of Architects. Frequently honored by his profession, Mr. Kimball had served two terms as President of the American Institute of Architects and was long a member of the Board of Directors. He also was first President of the International Professional Men's club. Many of Omaha's finest buildings stand as examples of his artistic designing, but his happiest professional work, he had said, was his selection of the architect for the state capitol. Mr. Kimball was in charge of the competition among architects seeking to design the capitol, often hailed as a notable example of the 'new architecture.' He also served in the same

capacity in selection of the designer of the Missouri state capitol and of the War Memorial in Indianapolis.

"Among the Omaha buildings he designed are the public library, the old Burlington station, the Fontenelle Hotel, St. Cecilia's Cathedral and the *World-Herald* building. He was an associate architect for the new federal office building. He was architect in chief for the Trans-Mississippi exposition in 1898. Last winter Mr. Kimball was in charge of civil works administration paintings, as an aid to artists in Nebraska. In 1930 he was the central figure in litigation seeking to oust his prized game cocks and other fowl from the estate of his mother, the late Madame T. L. Kimball, at 2236 St. Mary's Avenue. Mr. Kimball carried the suit to the Supreme Court to keep his roosters on the property, but lost. He started his professional career in Omaha with the firm of Walker, Kimball and Best. Later this became Walker and Kimball, and in 1899 Mr. Kimball founded a firm under his own name. In 1928, he joined the firm of Kimball, Steele and Sandham. Mr. Kimball had lived for 25 years in the home at 2450 St. Mary's Avenue, which he designed. He is survived by his wife, Annie, and a sister, Miss Arabel Kimball." — WALTER H. KILHAM, Secretary, 126 Newbury Street, Boston, Mass.

1890

We regret to announce the death of our classmate, Calvin Rice, on Tuesday, October 2. The following account appeared in the *New York Times*: Dr. Calvin Winsor Rice, widely known engineer and for the last 28 years Secretary of the American Society of Mechanical Engineers, died last night in the Murray Hill Hospital of a cerebral hemorrhage. He had been taken suddenly ill during the afternoon and was rushed by ambulance to the hospital. Dr. Rice was 65 years old.

"During an exceptionally active life Dr. Rice had traveled extensively and had received many honors both in this country and abroad. For a number of years he aided in an effort to foster research in every field by American engineers and students. — Dr. Rice was born at Winchester, Mass., and was the son of Edward Hyde and Lucy J. Staples Rice. He was graduated from the M.I.T. with the Class of 1890 and received a doctor's degree in engineering from the Technische Hochschule at Darmstadt in 1926.

"He joined the Thomson-Houston Electric Company in 1889 and was employed by that firm for four years as an assistant engineer. In 1893 he became electrical engineer for the General Electric Company, leaving to join the Anaconda Copper Mining Company and the Silver Lake Mines Company, where he served as electrical superintendent. He also served with the Kings County Electric Light and Power Company and then became electrical engineer for the Consolidated Telegraph and Electric Subway Company, which owned and operated the high tension subways of New York. At

that time he also was chief of meter testing for the New York Edison Company. In 1903 Dr. Rice became Vice-President and Sales Manager of the Nerst Lamp Company and a year later was appointed consulting engineer of the General Electric Company. In 1915 he was a member of the jury of awards of the San Francisco Exposition.

"Dr. Rice had been active in many branches of the engineering profession, but had specialized in the electrical field. Much of the recent research carried on by the General Electric Company was with the aid and supervision of Dr. Rice. For several years he was active in the rapid advancement of home radio receiving sets and in 1925, with E. W. Kellogg, he invented a hornless loud-speaker. Dr. Rice was Secretary and a member of the Board of Trustees of the New York Museum of Science and Industry, a member of the Corporation of the M.I.T., national counselor of Purdue Research Foundation, a Fellow of the American Institute of Electrical Engineers, a member of the London Society of Electrical Engineers, Masaryk Academy at Prague, the Deutsches Museum of Munich, and the American Society of Safety Engineers.

"He also was a member of the Koninklijk Instituut van Ingenieurs (Holland); corresponding member of Argentine and Chilean engineering societies, and was a member of the Society of Mayflower Descendants. He had received the Knight Cross of the Order of the White Lion from Czechoslovakia; the Medal of Honor of the Verein Deutscher Ingenieure at its 50th anniversary in Cologne in 1931 for his services to technical-scientific achievement, 'particularly in promoting mutual international interests of engineers of the entire world.'

"Dr. Rice was a member of the Engineers Club of New York. His offices were at 29 West 39th Street, where he was taken ill. His home was at Montclair, N. J. He is survived by his widow, a son, Edward Winslow Rice, and a daughter, Miss Marjorie Rice."

Mr. and Mrs. Darragh deLancey announce the marriage of their daughter, Margaret Spencer deLancey, to Dr. Joseph Linn Hetzel on the 12th of October, 1934.

The following new addresses have been received: Francis W. Crosby, 912 Englewood Road, Cleveland, Ohio; Charles F. Fitts, 80 East Jackson Boulevard, Chicago; Martin O. Southworth, 5626 Lake Park, Chicago; Samuel Storrow, 4357 West Fifth Street, Los Angeles; Henry M. Waite, Deputy Administrator of Public Works, Interior Building, Washington, D. C. — GEORGE L. GILMORE, Secretary, 57 Hancock Street, Lexington, Mass.

1891

Fred Blanchard is out again after several weeks enforced idleness, following an operation. He is now living at 123 Longwood Avenue, Brookline, Mass. — George Spooner's daughter, Marjory, was married at Miami, Fla., on September 19 to Herbert S. Hilton. They are to live in

1891 Continued

Havana, Cuba. — Harry and Mrs. Cole have another granddaughter — Justine West — born September 15.

Some of the more recent visitors to Cohasset were: Harry and Mrs. Bradlee and Betty, Rowland and Mrs. Barnes, Gorham and Mrs. Dana, Arthur Hatch, Charlie and Mrs. Wetherbee (from Bath, Maine), George and Mrs. Holmes, Ed and Mrs. Earl, Howard Forbes. Barney is now moving about a little on crutches, his broken arm having healed in fine shape, so that he can use it again.

Will Lawrence writes Barney: "Things are busy here as usual and next week the Lowell lectures begin. They, together with my other work, will keep me in town five evenings out of the week. Hard work but very enjoyable and interesting, and gives me a chance to meet some fine men. Before this rush really begins I am going to steal away for the week-end in the White Mountains — in spite of the rather gloomy prospects so far as the weather is concerned.

"Had just a line from Elisha Bird a short time ago in connection with the introduction to me of two students, friends of his, coming here."

The Lowell Institute, of which Professor Lawrence is Curator, is on its 95th year. Five distinct series of lectures are now provided as follows: 1. Free Public Lectures in Huntington Hall, in the Rogers Building, 491 Boylston Street. 2. Free Evening School under the Auspices of the Massachusetts Institute of Technology. 3. Collegiate Courses. 4. Teachers' School of Science. 5. Free Lectures in King's Chapel on Current Topics in Theology. The Free Public Lectures cover a large variety of subjects, such as Law Making, Health and Medicine in Colonial Days, Chaucer's Men and Women, the Social Framework of an Industrialized World, Earthquakes, The Arabs, Church Music and Choir Training, Criminal Justice.

Anna Gove wrote Barney that college is in full swing. She has been teaching for some years at the Women's College, University of North Carolina, Greensboro.

Charlie Garrison sent a letter by air mail, took just two days from Santa Barbara to Cohasset. Charlie used the new National Park Stamps, tastefully arranged, and very attractive — pictures of the Yosemite, Grand Canyon, and Mt. Rainier. Charlie spent part of the summer in Santa Barbara. He tells of his experience the past year in operating motor cars; can anyone beat it? "(1) My old Hupp; (2) Bob's old Ford Touring car; (3) my sister-in-law's four-cylinder Ford Sedan; (4) Bob's six-cylinder Auburn (now turned in); (5) Bob's 12-cylinder Auburn (now turned in); (6) New Plymouth Convertible; and (7) the new streamline De Soto."

George Hooper sends a long and interesting letter telling of his various auto trips this summer. They made their headquarters at Santa Barbara. The first trip was north along the new shore highway which goes to Monterey. "On the way we passed the Hearst Hacienda

(estate) at San Simeon, the highway bordering this for some distance. The huge structure of a house is visible on a mountain top, a drive of several miles being necessary to reach it, but visitors are not admitted. Between San Luis Obispo and Morro Bay is the summer camping ground of the California State Militia, but this was practically deserted, the troops being on strike duty in and around San Francisco."

A second trip was to the Feather River District about 100 miles north of Lake Tahoe. "Repeal of prohibition seems to have demoralized this backwoods country, so-called 'Sporting Clubs' existing everywhere, these being nothing but devices for circumventing the State drinking and gambling laws."

As the fishing didn't prove satisfactory, they went to Lake Tahoe and found conditions changed. "New high-gear roads have been built for reaching the Lake and the encircling roads all rebuilt; the people have responded by filling the resorts, which have also been improved, so that this was the only thriving resort which we found. We stopped for a few days at Colenbrook on the Nevada side of the Lake. This was once the site of a large lumbering operation conducted by a Mr. Bliss of San Francisco who had two sons in M.I.T., I think in '95. The logs were brought in on narrow gauge railway from the forest and after milling the lumber was chuted by flumes fed from the Lake about 14 miles to the vicinity of Carson City, Nev., when it was again hauled by narrow gauge roads to the mines at Virginia City and other places. From here we started for Feather River, going around the lower end of the Lake to Tahoe City, hence through the beautiful Truckee River Canyon to Truckee where we expected to take the highway north. The main highway was being rebuilt so we were advised to take by-roads to reach our destination and these were atrocious. Also they were infested by trucks hauling logs to the numerous sawmills of the district. They take the largest size of Mack truck and connect a heavy trailer to it by about 12 feet of heavy pipe. Then about 15 to 18 logs, any one of which will weigh over a ton, are loaded on and away they go. To meet these things on a narrow, crooked, hilly, rutted, dusty, forest road is a real experience. While the drivers proved good natured, they cannot do much in the way of turning out, so that the small car has to do it all as best it can."

Then to Reno, Nevada. "On the way we overtook a large flock of sheep, probably several thousand, which was having its noonday bivouac. The herders had fastened their horses to the fence, lighted their fires, and were preparing their noon meal, while the sheep occupied the highway regardless of traffic. By crawling along, weaving across the road as 'holes' showed themselves, and constant 'honking,' we got through without great difficulty. A majority of the sheep herders here are said to be Basques from Northern Spain. They are

said to understand sheep and their care thoroughly and seem a good-humored lot, but they speak no language that a white man can understand." Then to Sacramento. "The country between Placerville and Sacramento is uninteresting save for those regions where place mining has been conducted by dredges. At a likely place they excavate a large basin and fill it with water. Then a floating dredge is built on this pond and it proceeds to dredge out and wash the soil, moving its pond along with it as it works. These dredges are huge affairs costing several hundred thousand dollars. They leave behind them a barren area of stone and gravel from which all of the alluvium has been washed and which is good for nothing."

Then to Palo Alto and Carmel and via the inland route to Santa Barbara. "The route led inland through the valley of the Salinas River and we had about 125 miles of the worst heat I have ever experienced. We had to close the windshield to keep the hot blast off of our faces and my wife was so oppressed that we purchased a carton of cracked ice and a turkish towel with which she secured relief until we crossed the mountains at San Luis Obispo and felt the sea air. Cars with tire blowouts were passed every few miles along the road and I was apprehensive that ours might go as I was doing 60 miles or better to pass sooner this hot belt."

The Secretary and Mrs. Fiske spent an evening with Howard and Mrs. Forbes recently. The Forbes are not enthusiastic about Spain, where they spent the winter. They found an easy-going people, not given to hard work, much poverty, and great unrest.

Gorham Dana is back from his summer home at Lake Sunapee. He has some fine movies which we hope will be our entertainment at a class dinner this winter. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R. I. BARNARD CAPEN, *Assistant Secretary*, The Early Convalescent Home, Cohasset, Mass.

1895

As a warning to the readers of these columns we relate the experiences of a few '95 mates, living in California, who have been victims of the fleecing game of "the son of your old college chum." We quote from the Pasadena *Star-News* of October 5, 1934: "When a Riverside bank President had just concluded listening to a radio broadcast telling of the 'son of your old college chum' swindle and a young man walked into his home claiming to be the son of an old college chum of his, things happened rapidly. The young man, who gave the name of W. R. Peck, was turned over to police and is to be brought back to this section to see if he can be identified by several Pasadena and other college graduates who have lost several hundred dollars through such a swindle. This swindle has parted old 'grads' from their coin on the theory that they were aiding a son of an old classmate who just happened to be

1895 Continued

stranded by an auto accident, or because he was arrested for speeding, or perhaps he had lost his purse." Alfred Zapf '95 was the first to sound the alarm, and through his "technical instinct" to check matters, he discovered he was a victim of this masquerader.

Milton Fish '95 of Pasadena, feeling slightly "burned" through his generosity, also aided in spreading the news. In consequence '95 men in California were on their guard and at last the young fellow was apprehended.

The story the young man presented is replete with exact knowledge of both scholastic and fraternity connections of the fathers in question, and each case had a masterful presentation to the prospect. The lad who has victimized about a dozen college men throughout California is about 24 years old, very dark, fine dark eyes, slender hands, oval face, about 5 feet 9 inches in height, slender, weighing about 140 pounds, cultured voice with a Boston accent, and attractive personality. The scheme is a wonderful plan to see the country at college men's expense. Watch your step! If you have anything to give away, give gently and remember we have a reunion next year — in 1935.

In the next issue of The Review, we hope to have a report from Johnnie Moore, who is now with the Regional Labor Board of the NRA, and who is scheduled to speak at the class luncheon of the New York Tech men on Thursday, October 25, at Hotel St. Moritz, New York City.

We regret to announce the death of Allen C. Jones in New York City on April 23, 1934. Jones was a Course II man and formerly resided at 85 Bronx River Road, Yonkers, N. Y.

Begin to save your pennies for the next reunion. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

No year would be complete without a report of a tour by the Fuller family. Their most recent trip has been to Colombia, South America. Sailing from New York, their first landing was in Puerto Colombia on the Caribbean, at the end of a mile long pier. This port is merely a trans-shipping point, and little more than a collection of mud and thatch huts for the laborers who handle the goods going down the Magdalena River. They drove by auto through jungle-covered hills to Barranquilla, which they found to be big, and shabby, and uninteresting. Returning to their ship they went next to the picturesque and interesting little city of Cartagena. The historic background of Cartagena makes it wonderful for tourists to visit. Incidentally, the formalities for landing in Colombia are much more extensive than those required in Europe. Besides a regular passport, one must have a vaccination certificate, a health certificate stating that he is free from every imagin-

able disease and is not a drug addict, a police certificate declaring that he is not a beggar and has not been in prison during the preceding ten years, and a letter of introduction from a recognized firm or society guaranteeing his integrity. If the traveler intends going into the interior, four four-page blanks have to be filled out, four photographs furnished, and thumb prints taken. A local passport is then supplied and on presenting it to the police a card permit to purchase the railroad ticket is given. However, the red tape is not difficult, and the officials are courteous. If we think the American dollar has depreciated, the Colombian dollar or peso is still worse, bringing only about 70¢. Automobiles are mainly American make and are cheap, driving rates ranging from 70¢ to \$1.40 (U. S. currency) per hour. Gas sells at about 25¢ per gallon. At the hotel in Cartagena, the Americano, rates, including room and meals, are \$3.00 per day U. S. currency. The conditions and food are very satisfactory. The only unsatisfactory procedure is that in the dining room the diner sits down before a stack of empty plates. The topmost is filled in succession with each of the *table d'hôte* courses, and as a diner finishes with a course the plate is removed and the next one below used for the next course until the lowermost is finished.

Their route from Cartagena was planned through an old Spanish canal connecting with the Magdalena River, and thence upstream to the Andes. A sudden strike of stevedores stopped the canal transportation line and the Fullers had to travel 65 miles by train to get to the Magdalena River, where the boats were still running. This gave them an excellent opportunity to observe the floods which Colombia had been experiencing. For distances the railway track, banked with sand bags and less than a foot above the water, crossed the lakelike expanse of flooded country. Cattle had to be driven from the track where they had taken refuge from the water. In one town boats were going from house to house and men were casually swimming in the main street. Reaching the Magdalena River they were dumped down for ten hours in the steaming tropical heat at a primitive hotel, but by midnight they were on their way up the Magdalena in an old Mississippi-type stern-wheeled steamer which, in spite of its age, was very comfortable. They had a breezy screened cabin back of the pilot house on the upper deck with electric fan, ice water in thermos bottles, and private dining room. The meals, Spanish in flavor, were not bad, with the exception that the meat was always stringy, for lack of being completely cooked. The first day on the river was through a region completely inundated by the flood, and the river channel was indicated only by the rows of trees along the original banks. In native towns the huts were inundated to the eaves, except in a few cases of higher locations. On the second day the water was a little lower, and the people could

be seen out on makeshift benches near the huts, and the animals on platforms of sticks, or such of them as had survived. The buzzards looked after those that drowned. During that night they had their first shipwreck. The steamer struck some big submerged tree trunks and ripped two holes in her bottom. Mail and freight was hurriedly removed from the holds to the upper deck. The captain fortunately reached a sandbar before the vessel sunk. All of this happened in the middle of the night, and the Fullers did not know of it until they got up in the morning for breakfast. A carpenter was secured to patch up the holes and the ship went on, getting into higher country, where mountains appeared in the distance rising in the clouds. The long delay on the sandbar exhausted the fuel oil and on the fourth day, although the steamer was an oil burner, it had to load up with native wood in order to get through until the next day where a supply of oil could be obtained. The last part of the trip was through rapids where the normal half mile width of the river narrowed to 400 feet between high bluffs. Christmas Day found them 600 miles away from the sea and at the foot of rapids too serious to pass. It was difficult to develop a real Christmas spirit in a temperature of 90°, with corresponding high humidity and mugginess. To get around the rapids it was necessary to take a train to the ancient Spanish town of Honda, and from that point they proceeded by American automobile to follow up the river still further, finally crossing on a little gasoline ferry and starting their 75 mile climb up the western face of the Eastern Andes. This drive was rather thrilling, with plenty of opportunity to look over the side of the car down vertically a distance of 1,000 feet to see where they had been half an hour before. Landslides were encountered, the results of the heavy rains which had brought on the flood. More often these blocked the road, and sometimes parts of the road had slid away, leaving hardly room enough for the car to squeeze by close against the cliff. To avoid accidents only one-way traffic is allowed on this road, alternating so that traffic goes one way one day and the other way the next. This story will be completed in the next issue. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1897

John R. Macomber, for many years President of Harris Forbes and Company, a banking concern of Boston, is Chairman of the Board of the First of Boston Corporation, the new organization that has been formed to take over the business of the First National-Old Colony Corporation which was the securities affiliate of the First National Bank of Boston. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 621 Franklin Street, Boston, Mass.

1900

A 'phone call was received from Allen to the effect that he ran across Tom Nesmith, the Varsity tackle freshman year, in the Department of Public Safety at the State House recently. This is good news, indeed, and takes Tom's name off the list of unknown addresses. Allen also said that Neall and he are still with the ERA and that Graff is with the PWA.

The sympathy of the Class is extended to Harry Osgood in the death of his wife recently.

On September 29 in Stoneham, Miss Helen Elizabeth Patch (daughter of Mr. and Mrs. James Alfred Patch of 47 Lindenwood Road, Stoneham, whose father is associated with the Patch Laboratories, Inc.) and Albert Edward Willis of St. Albans, Vt. (district manager in Portland, Maine, for the Standard Oil Company of New York), were married at four o'clock at the residence of the bride's parents by the Rev. L. G. Van Leuwen of the First Baptist Church. The couple will live at The Birchwood, Stoney Brook Road, Cape Elizabeth, Maine. The bride is a graduate of Wheaton College and the bridegroom a graduate of Middlebury College.

We regret to record the death on August 10 last of John McClary Perkins, Course VI, at his home, 77 Fairfield Street, Springfield, Mass.

Locke writes as follows: F. C. Lincoln, Professor of Mining at the South Dakota School of Mines, Rapid City, S. D., was away from the school during the summer doing work in Wyoming and Colorado, and later making examinations on the Pacific Coast.

Remember, you are setting aside a few days the first part of next June for the Thirty-Fifth Reunion. Plans are already under way for the best one yet. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

1901

Our Alumni Council now has the privilege of nominating two alumni for each of the departmental visiting committees which the Corporation appoints for cooperating with our various divisions at the Institute. I am happy to note that Fred Clapp was selected as a member of the Visiting Committee for Geology. As you know, Fred, after a sojourn in Jerusalem, returned to his native heath in August.

Let me repeat that next spring we reunite and that after having our own private party over the week-end of June 1, we join alumni from other classes at a celebration of Alumni Day at the Institute on June 3. — ALLAN W. ROWE, *Secretary*, 4 Newbury Street, Boston, Mass.

1905

THIRTIETH REUNION COMING.

Bob Luce, I, Commander, U. S. Coast and Geodetic Survey, is back in Washington. But before leaving the Philippines he wrote the following account of his more

recent years. It seems to us a model report to be followed, we hope, by classmates when solicited. "For four years, until April, 1932, I was fortunate to be located in Boston in charge of the New England district of the U. S. Coast and Geodetic Survey, and met quite a number of my classmates; I also had the pleasure, at Johny Ayer's request, of getting somewhat in touch with student affairs at the Institute by giving a talk on engineering aspects of this service to the graduate course of, I believe, harbor engineering.

"In May, 1932, I was sent out to Manila as Director of Coast Surveys, in charge of the work of the U. S. Coast and Geodetic Survey in the Philippine Islands, and also Director of the Philippine Government Bureau of Coast and Geodetic Surveys, arriving in Manila and taking over the work in July, 1932.

"Starting in 1901, when no comprehensive survey of the waters and coasts of the Philippines had ever been undertaken and, consequently, navigation of the waters of the archipelago was fraught with considerable risk, the U. S. Coast and Geodetic Survey has for the past 33 years been busily engaged in charting the waters and mapping the shore line and adjacent coastal areas. At the present time approximately 80% of the area has been completed — and of course the 20% remaining comprises the least important sections, and even these are rapidly approaching completion.

"At the present time we have two survey vessels in operation, staffed by commissioned officers of the service, with Filipino crews. At Manila the service has a well-equipped office where all survey data is worked up into final form, and printed, by photolithographic process, into finished nautical charts. In addition, the Bureau prepares, prints, and issues topographic and airway maps of the archipelago.

"All in all, the work is extremely interesting, and while I have naturally enjoyed it very much, as well as other advantages offered by Manila and its marvelous mountain resort, Baguio, I shall be rather glad to return to the States when my tour of duty expires out here in July of this year. Where my next assignment in the States will be is not known at the present time.

"Have I mentioned in previous accounts that Mrs. Luce and I now have a future Tech man, Robert James Luce, born in August, 1929? That occurred during our stay in Boston."

Mysterious music of popular and classical variety is offered patrons of the new Ritz-Carlton (Boston) lounge-bar. Where the music comes from is the problem. It sounds differently in various parts of the two rooms, but nobody will ever understand the novelty unless somebody decides to make known the secret. The new room, which has been constructed out of the bookshop on the Commonwealth Avenue side, was designed by Strickland and Strickland, Back Bay architects. It is in the classic Louis XV style and, according to the management, "there is nothing like it except in London and Paris."

Charlie Smart, II, wrote from Troy last spring: "I am still a director and works manager of W. and L. E. Gurley, makers of engineering instruments since 1845. At this writing we are very busy, a big change from one and two years ago at this time. Our daughter was graduated from Wellesley in 1930 and until a year ago was on the staff of the Newark Museum in Newark, N. J. Our son graduates from Dartmouth in June. He intends to take graduate work in psychology at some college yet to be determined."

Gordon Bill, I, for some years Dean of Admissions at Dartmouth has been elevated to the post of Dean of the Faculty. — Captain Clayton M. Simmers, XIII A, is on duty at the Fore River plant of the Bethlehem Shipbuilding Corporation, where Henry Keith, XIII, puts in much of his spare time, Henry did not go to the Clyde to help launch the *Queen Mary*. — Ray White, VIII, who for some time was in Canada with the Abrasive Company, has been transferred to Bridesburg, Philadelphia. — Toots Dissel, II, has a daughter just through Radcliffe, one just in and a son at Wentworth Institute. — Bill Green, VI, is said to be in New York; address: 400 West 118 Street.

And we have had this one from Billy Ball, III, for some time: "Traveling in short Pullman berths is gradually increasing the size of my halo on the top of my head.

"While I have met Tech graduates of other classes, I have not been fortunate in running into members of 1905. I suppose I should carry a register of graduates with me so I could ferret them out of some of the cities and towns I visit. After finding one of our tribe we could follow the old Eskimo custom of rubbing noses or, if the occasion seemed to require it, we could drink to each other's health with a good old stein of sarsaparilla or something.

"Charlie Johnston was in town this winter. He is a regular human dynamo. What a boon he has been to the match business during all these years. He still uses a box of matches to a pipeful of tobacco.

"You know there were many of us at Tech who vowed by all that was holy that if we were ever blessed with children we would see that they never put a foot inside the door of that institution. In other words, work there was only one step removed from slavery. That was that. Next (last) June, Bill, Jr., graduates, if all goes well, in Course XV, which only goes to show that time is a great softener of the soul."

Bill Morter, III, drove alone across the country in May and somewhere in California picked up the "Chief Officer and Cabin girl" (who had gone out by ship) and returned them to New York. To some of us such a trip would be a great adventure but Bill didn't seem to think there was anything to write up.

In an attempt to reach some of our classmates who do not see the class notes, arrangements were made with the publishers of *The Technology Review* to send a copy to each of 100 non sub-

1905 Continued

scribers. At the same time a form letter was sent to which we have received just two replies, a rather poor return. Bill Mann, III, out in California, was aroused and propounded some questions on the whereabouts of "he of the red hair" (that was John Glidden), Henry Buff, and Milton Rubel, all Course III, which were answered.

A charming photograph of Miss Esther M. Barlow, daughter of Jim, I, City Manager, appeared in the Portland (Me.) *Press Herald*. She resembles her mother, pitcher of the women's baseball team at the Marion reunion. Even covering her hair, we could find little resemblance to Jim.

John Glidden, III, wrote from Peru last March: "This Mahi tunnel that I am working on will be nearly six miles long when it is completed; the end is now in sight, as we expect to make the communication sometime in June and then the job will have taken about five and one-half years. I shall have been here a little over four years of that time.

"It may seem a long time for driving a tunnel, but the necessities of the case limited us to driving from only one heading. Then we were driven out three different times by floods of water amounting to 40,000 gallons or thereabouts and had to wait for enough subsidence to allow us to resume work. An old river bed of some 1,800 feet demanded nearly a year to get through it; there was a strike, too, which set us back some six weeks. So you see, there was a little more to it than mere tunnel driving alone. At one time I wrote you rather proudly that we had not had a single fatal accident up to that point but that record vanished and now we have to lament six deaths. I myself have been rather lucky in that I got stuck in the hospital only twice so far and for only slight hurts. When the work ends I shall have to start rustling again and at the moment scarcely know where to make a start in hunting a job.

"Say, Ros, do classes ever have special 30-year reunions? I have been thinking that I would like to be in Boston again 1935 and see those of the class who would be there. I rather think, too, that it would be a good idea to have a 30-year class album so that one could see how his classmates look today. Is such an idea at all practical?"

The annual dinner of the Chemical Society of Washington was held, last spring, in honor of the award of the Hillebrand Prize for 1933 to the late Edward W. Washburn, V.

"William Washburn, son of Dr. Washburn, in a brief speech of acceptance, expressed the appreciation of the family for the award and thanked the colleagues of Dr. Washburn at the Bureau of Standards for their part in the research concerning the isolation and preparation of heavy water. W. A. Noyes, of the University of Illinois, paid tribute to the integrity and scientific attainments of Dr. Washburn, and traced the story of his career in chemistry. F. H. Brickwedde, of the Bureau of Standards, spoke comprehensively on the 'Beginnings of the Chemis-

try of Deuterium,' in which he emphasized the importance of Dr. Washburn's work in the development of a practical method for the preparation of quantities of heavy water."

The additional work incident to the extensive reconstruction of the Wesleyan University gymnasium kept your Secretary busy this summer, and no let-up yet (October). A lengthened pool with new balconies, an entirely new locker room with full-length locker for every one of the student body, an addition with provisions for trainer, visiting teams, supplies, toilets, faculty, and so on and a separate building with 15 squash racquet courts will, with the existing 20 tennis courts, four diamonds, two football and two soccer fields, and "cage" (not the Tech kind) give to the college facilities second to none of its size.

Wesleyan's modern plant, including also library, laboratories, theater, oil-burning power plant (as spotless, nearly, as Keith's Theater, though the firemen are not in white), should be worth stopping off to see. This is an invitation. Hope you'll accept. — ROSWELL DAVIS, Secretary, Wes Station, Middletown, Conn. SIDNEY T. STRICKLAND, Assistant Secretary, 20 Newbury Street, Boston, Mass.

1907

From the social columns of the Boston *Herald* we learned that on October 12 Miss Barbara Wires, daughter of E. Stanley (Stan) Wires, was married in the Wellesley Hills (Mass.) Congregational Church to Howard Key Bartow, Jr. The Rev. Howard Key Bartow of Quincy and Cohasset, Mass., officiated at his son's wedding, assisted by the Rev. Carl M. Gates of the Wellesley church, and Stan gave his daughter in marriage.

Speaking of domestic affairs in the lives of children of members of our class, Bartlett Nichols, oldest son of the class secretary, became the father of a fine girl, Barbara by name, on September 23.

A communication received in October from Robert K. (Bob) Taylor tells us that he is borough engineer with the City of New York, Department of Parks, with office at Borough Hall, Tremont and Third Avenues, Bronx, N. Y. He is in charge of all engineering in connection with the 108 parks, three of which exceed 1,000 acres apiece, in the Borough of the Bronx. After 1907 Bob was engineer's assistant in the Department of Public Health with the State of Massachusetts for three years, and then until 1917 was an assistant engineer in the transit department for the City of Boston. After working for four years as managing engineer for a firm of general contractors in Boston, he returned to the Transit Department in 1921, where he remained until 1925, when he went to Philadelphia to do similar work. In 1929 he became assistant engineer for the Board of Transportation of New York City, and in 1933, became borough engineer, as described above. Bob and his wife live at 2725 Marion Avenue, The Bronx, New York, with their two children, Robert H. Taylor, 21 years old, and Barbara Ruth, 19.

Frank MacGregor sailed on October 6 for Buenos Aires, Argentina, on business for the duPont Company, with which he had been associated for many years. — O. L. Peabody (Peabo), still unable to secure permanent work, is again taking some special work in chemistry at the Institute, as he did during last winter. His address is 32 Clearway Street, Boston. — The Secretary telephoned to William S. Wilson in October. Wilson said he had nothing of particular interest to report. He is still chemist at the Merrimac Chemical Company in Everett, Mass., and home address is now 18 Bellingham Road, Chestnut Hill, Mass. He has no children. — BRYANT NICHOLS, Secretary, 12 Newland Street, Auburndale, Mass. HAROLD S. WILSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

Class pictures ordered at the Twenty-Fifth Reunion were mailed in September. If yours has not been delivered, please notify the Secretary. The delay was caused by the fact that the photographer did not deliver the prints as promised.

We have an announcement to make: Following the established policy of having Class Officers located in different parts of the country, George Wallis was asked if he would be willing to act as an Assistant Secretary for the Class of 1909 in Chicago. George is always glad to do what he can for the Class and has consented to assume this responsibility. For many years the New York crowd have been getting together two or three times a year for a Class luncheon and it is hoped that similar luncheon meetings may be held in Chicago. George is President of the Creamery Package Manufacturing Company, located at 1243 West Washington Boulevard, Chicago, Ill.

Paul Wiswall writes: "Here is the kernel of a letter I had from Tom Desmond the other day: 'I was desperately sick this summer with pneumonia and complications and nearly passed out. I am well on the road to a complete recovery now, however. The doctors say that there will be no permanent ill effects and that within a few weeks I shall be as well and vigorous as ever. Sorry I cannot come to the class luncheon on the 27th. Best regards to yourself and all others of the class. I felt badly to miss the 25th reunion last June, which came while I was very ill.' Tom is at the Lake Placid Club, Essex County, New York, where he has been for several weeks under medical treatment. A letter I recently received from Mrs. Desmond confirms what Tom says about the close call he had and the good recovery he is making." — CHARLES R. MAIN, Secretary, 201 Devonshire Street, Boston, Mass. Assistant Secretaries: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

Plans are under way for the class reunion next June — the 25th! How the time does fly. Our President, Frank Bell, writes from Texas to start the ball rolling

1910 Continued

and appoint a committee to handle affairs. The following have so far been appointed to work on the reunion: Herb Cleverdon, Chairman, Charlie Green, Phil Taylor, Ted Whitney, Karl Fernstrom, Jack Babcock, Dean Peabody, Hal Billings, and John Wentworth.

The program will have to depend to some extent on the plans for the All-Alumni celebration which have not yet been settled, but 1910 will undoubtedly have one of its famous dinners, a week-end visit to some hotel or club, and other events. As this is written on October 25, it is impossible to report the results of the Council Meeting on October 29, which will discuss the All-Technology Reunion, but several of the committee expect to attend the meeting to decide about reunions.

By all precedent, this should be our biggest gathering and it is hoped that everyone who can possibly make it will attend. All suggestions will be gratefully received by your Committee. You will hear more about the plans as they unfold, both in this column and by mail. — DUDLEY CLAPP, *Secretary*, 40 Water Street, East Cambridge, Mass.

1911

Woe is me, wo-ho is me! Despite my earnest protestations not one single classmate has written to me during the month which has passed since the last notes were typed — not one. This can't go on and won't, if I know my '11 class spirit!

In the October 11 issue of the Boston Evening *Transcript* under the caption "Flying to Capital for Convention" is a picture of Emmons Whitcomb, X, with a group about to take off for Washington for the Annual Convention of the National Aeronautic Association. Whit's proverbial smile is, of course, in evidence.

The lost is found; at least Sam Schmidt, VII, who hailed from Winthrop and for whom we have long had no address, is found, according to the Alumni Office, at 895 Blair Avenue, Cincinnati, Ohio. From the same source we learn that Zeke (H. D.) Williams, XI, National Cash Register fixture, is now working out from 420 Lexington Avenue, New York City, with Erwin Wasey and Company.

While attending the annual meeting of the New England Hotel Association at Greenfield, Mass., in late October, I had as a golf partner the manager of the Colonial Hotel at Gardner. He told me Stan Hartshorn, II, is a leader in civic affairs there in Gardner, being President of the City Council, as well as an active Rotarian.

Many of us remember an active freshman when we were Seniors — Porter Adams '14 — and we know that Norwich University in Vermont has made a most wise move in inducting him as President this October. Best of luck, Pat!

At the present writing we have good addresses for 378 classmates and their geographical distribution will, I know, be of interest. Curiously enough exactly one-third are located in Massachusetts, the figures being: Metropolitan Boston, 94; balance of Massachusetts, 32; rest of

New England, 36; Metropolitan New York, 51; balance of New York State, 16; Middle-Atlantic States, 33; South, 10; Middle West, 41; Southwest, 9; West, 29; U. S. Possessions, 5; Canada, 8; Mexico, 2; South America, 4; Europe, 5; and Asia, 3.

Now please reread the opening paragraph and then obey that impulse! — ORVILLE B. DENISON, *Secretary*, Douglas Hill Inn, Douglas Hill, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1914

The notes this month consist largely of reports of two odysseys; one by Charlie Fiske and one by Dean Fales and your Secretary.

Charlie made a hasty swing around the country and wherever time permitted contacted with Classmates. He started out bravely expecting to make many calls, but unfortunately extra pressure from "business first" made it necessary to abandon several of the calls he had planned. Charlie, nevertheless, did glean quite a bit of information regarding the doings of '14 men.

In Chicago was found Freddie Hurlbutt, of the Patent Scaffolding Company of Illinois, yearning for a Washington Monument to be cleaned. A. H. Miller, of Electric Research Products, and Doc Leslie, who has his own welding company, both expressed great appreciation at being able to talk with Charlie again as both had missed the reunion. Unfortunately, Otto Fick and Frank Jerome were out. A little preliminary discussion was had regarding the possibility of getting the gang together this winter and showing the reunion pictures.

Up in Minneapolis Charlie found Dave Sutherland doing a nice business representing the General Electric Company in certain specialties. Dave operates quite an organization known as the Sutherland Air Conditioning Company. Across the river in St. Paul, Charlie visited Lyman Baird, who is the head of the Dampier-Baird Company, which under Lyman's guidance has become one of the most prominent undertaking establishments in that section. Lyman showed Charlie plans he had for a rather imposing chapel on which he hopes to start construction soon.

At Kansas City Jimmy White was visited. Jimmy is still in the seed business, having completely deserted his electrical training. He also brought his class statistical record up to date by reporting two daughters, aged eight and three. Charlie also talked with Bill McPherrin, who is one of Kansas City's enterprising life insurance agents. Bill reported that he could not make the reunion because he had to go to the Pacific Coast. In a month Bill, with his wife and nine- and 13-year-old boys, drove 10,000 miles.

The second trip was made by Dean Fales and your Secretary, by separate transport, to Northfield, Vt., to attend the Inauguration Exercises of our distinguished classmate, Porter Adams, as President of Norwich University. As

members of the Class of 1914, Fales and your Secretary felt very honored to be able to be present at such a distinguished occasion. We are sure that every member of the class who knows Adams was there in spirit.

A motor procession formed in front of the Capitol at Montpelier and escorted the Governor of Vermont and President-Elect Adams over to Northfield. Here they were met by an escort of cavalry and on entering the grounds of Norwich received the official cannon salute.

The inauguration itself was very colorful. Norwich being a military institute provided a brilliant spectacle of uniforms, which, combined with the many colored robes of the academic procession, made indeed an impressive sight. With great solemnity, President Adams was given the oath of office by the Chief Justice of the Supreme Court of the State of Vermont. By virtue of his office, Adams became a Colonel in the Vermont National Guard. Following the inaugural there was a military review in Adams' honor. The Cadet Band also played a new march dedicated to him.

Technology was represented by Dr. Bush, Vice President of the Institute, and H. E. Lobdell, Dean of Students, as well as by Professor Fales for the staff, and your Secretary for the Corporation. The principal address of the day was delivered by Dr. Bush and was inspiring not only to the students of Norwich but to all attending the exercises. Fales was also the official representative of the Society of Automotive Engineers, and your Secretary of the Institute of Radio Engineers. That versatile son of Technology, Dr. Allan Winter Rowe '01, had a very active part in the entire program. He, however, appeared not as a representative of Technology but as one of the distinguished trustees of Norwich University and a delegate of the University of Goettingen.

A near riot occurred in the very shadow of the Capitol of Vermont when your Secretary's automobile was in collision with that of Dean Fales. In appropriate First-Avenue-of-New-York style Fales expressed his opinion of the situation and succeeded in bringing to his immediate aid three Vermont State Troopers. Summary Court was promptly held, Fales' defense being that his car was not in motion. He was promptly overruled by the Senior Trooper by being informed that he had his choice of stating that he was in motion or else explaining why he was parked in front of a hydrant. However, an examination of the car revealed that, in addition to containing Professor Fales, it contained Dean Lobdell, who is a close rival in size — in breadth at least — of Fales. Under the circumstances it was felt that any car would have considerable difficulty in getting under way with such a load. The matter was amicably settled that evening.

On the way up to Vermont a call was made in Concord, N. H., to see Leigh Hall but unfortunately he was in Boston that day. If your Secretary's memory is right, this is about the 19th time he has tried to find Leigh at home. He has, ac-

1914 Continued

cordingly, come to the conclusion that Leigh's automobile business runs along without him.

On the way back a stop was made at Derry Village, N. H., to see Malc MacKenzie. This was a most serious call because last summer Malc refused to stop when signaled on the highway of Kennebunk Beach, Maine. He was discovered by Fales and your Secretary, and they desired to initiate him to the Kennebunk Beach Chowder and Marching Club. Malc has been assured that when the initiation does happen it is going to be doubly hard for him. In addition to being a loyal '14 man and helping out whenever called on, Malc is Secretary-Treasurer of the Technology Club of New Hampshire, and under his guidance real activity is being brought back into that organization. — HAROLD B. RICHMOND, Secretary, 30 Swan Road, Winchester, Mass. CHARLES P. FISKE, Assistant Secretary, 1775 Broadway, New York, N. Y.

1915

Times at bat, 465; hits, 38; batting average .080. Surely not impressive enough to arouse any big league scouts. Translated into English, this means that of the 465 mailings to classmates for dues, there have been 38 checks received. This is most disheartening and discouraging. When you owe a commercial account you are morally and legally obligated to pay it. Even then you probably resent the well-known collection letters, but your class dues entail no obligation to pay, simply your loyalty and desire to help the class. Put yourself in my job and you can see what I'm up against trying to raise money for our class funds. Being a class officer is no easy job, but I like it and (modestly) give you my sincerest and best efforts to keep alive the class organization and some class spirit. Please don't let me down with a feeling of humility in regard to these class dues. I'm not ashamed to ask you for them. To send your dues does not require a stamp, just stick your check in the envelope and send it in.

Next month I hope to have the report of the first dinner meeting to arrange for the Twentieth Reunion next summer.

One of the old-timers has just come to life with the following interesting letter. Ed Waldron is supervising principal of Union County Schools in New Jersey: "I was surprised and pleased to receive your letter yesterday, particularly after a letter I wrote the Alumni office a short time ago. I do get rather a kick out of hearing from some of the old gang once in a while. In fact, I have often wondered what became of Frankie Wall. You see, I really don't belong to M.I.T. I received my Bachelor of Philosophy from Brown in 1917, after much hard work on the crank of a moving picture machine and many trying days as a clerk behind the counter in the Y.M.C.A. Then, on top of that we had a war. I am not sure that I know yet what it was all about. Nevertheless, I wore a hunk of gold braid around the deck of a sub-chaser which was shipped off to Panama, where we pa-

trolled and did airplane scout work until they made me Engineer Officer on the old *Farragut*. On board her we swept the channel of a mine field twice a day. After the Armistice we found out there never had been a mine field there.

"Well, after much shenanigan around, we got out of service after the Armistice. I tramped the road of many a weary job hunter, much the way a good many people are doing nowadays. After six weeks I got some work, finally teaching school the following September, and have been in school work ever since. I celebrated my first school job by getting married to the best young lady that ever graduated from the Women's College of Brown University. Every job seemed to be a little step up, and since I seem to be addicted somewhat to attending colleges, I took courses in various places; finally acquiring my Master of Arts degree from Yale University.

"I have been in my present job since January, 1927, with 125 teachers and 4,000 youngsters, hoping that we may live long enough to see the public resold on education as an essential factor in life. When I get too pessimistic I cheer myself up by writing an article for a magazine — a few of which have been published — or chasing down in my work shop to work on what little chemistry I still remember, or on the development of a new type of model boat or model airplane. Lately I have been relaxing once a week by giving a course as extension work from Rutgers University in Newark. Next year I may have two courses instead of one to worry about. At least, it is a place that lets idealism come forth.

"I still have one rather insane desire. I should very much like to come to M.I.T., not in any way, shape, or fashion as a former student or as ever having been connected with it, but for the task of doing some personnel direction work and some actual guidance work with the student body; which I am firmly convinced accounts for more than one-half of loss in students that M.I.T. has. They never did have a guidance program that amounted to anything, and they lost a lot of good material because they didn't. Also, I feel there ought to be a revamping in course. So many of my friends have told me that they felt out of it, as if they lacked education, that they were simply mechanics when they graduated. It doesn't need to be that way, provided they would develop their courses to make a real educational program as well as an engineering course. Oh well, these are idle dreams.

"I am having a good time in life, and am learning many things. I still wish I was in close contact with a few of the old gang that I used to know up at the Union in the days when Tech was on Boylston Street.

"Well, we are having a celebration at our house today. Bobby, age 13, and Betty, age 11, are putting on a birthday party for Rosmond, one year old today. It is a great old life and I thank God for families to make us remember that there are other things beside depressions to

live for, and after all, a depression may be a state of mind if there is back bone enough to dig in.

"I wonder what happened to Tallman, Calder, Gink McKenzie, and Pond; and what is Frankie Wall doing? Somehow or other, I had a hunch he'd get there, too."

I hardly know what accord to give this splendid letter from McCeney Werlich, X, written on very formally and impressively embossed stationery of the "Embassy of the United States of America." I felt relieved to find upon examination that the eagle in the seal has nothing to do with the screeching blue eagle of the NRA: "I do not know whether you will call silence golden in my case; perhaps it should be, but none-the-less I shall take pity on you and send along some news about myself. I believe I wrote quite a while ago that I had been transferred from the Embassy at Warsaw, Poland, to the Legation at San José, Costa Rica. This latter place was wonderful, for I had the most perfect pastimes, such as one revolution, beautiful orchids, plenty of exquisite rose bushes, a good chief, and a fair golf course.

"I went back to Washington on leave in March of 1933, flying all the way from San José and taking the famous American Clipper from Barranquilla to Miami. When I got to Washington I asked for a post with more work and less flowers, suggesting that Berlin would be an excellent place. The Department, true to form, transferred me about six weeks after this request to Liberia, a place of much darkness from every point of view. I put in seven months here and came away with a rotten dose of malignant malaria.

"Now I am back at my old stamping ground, Paris, where I have been pinch-hitting as Private Secretary to the Ambassador and putting in full time on French food. I am sorry that I have no photograph to send in which might be suitable for a class baby contest. The Werlich infant — with a much simpler name than his old man's — namely, Robert — has now the following specifications: years, 10½; height, 5 feet 3; weight, 112 pounds; brains — oh well, it is not for a father to speak about his only child. — Maybe all the foregoing will be able to pad up some space for you. At any rate, this letter brings you my very best wishes." You can see from this what a picturesque life Werlich has been leading and that despite the buffetings of the diplomatic service, he retains his charming sense of humor.

Remember those famous words: "It is better to give . . ." than to have an empty class treasury. Send me that check. — AZEL W. MACK, Secretary, 72 Charles Street, Malden, Mass.

1916

Your Secretary is pleased to give the following letter from Rudolf Gruber: "In giving you this little news item, I may be duplicating somebody else's effort, but I suppose you would rather have the same news twice than no news at all. At the fall meeting of the American Chemical Society in Cleveland during

1916 Continued

the week of September 10 there was a very fine showing of Tech men as evidenced by the large attendance (56, I believe) at the M.I.T. luncheon which took place at the Statler Hotel on the 11th. Participating in the proceedings, scientific as well as social, were three of your famous classmates in the order of importance: Bob Wilson, Bill Leach, and your humble correspondent. If there were any other '16 men, I missed them." — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, Bemis Bro. Bag Company, Memphis, Tenn.

1917

I finally accepted Brick Dunham's invitation to visit his chocolate plant in South Boston and in addition to the pleasure of seeing the father of twins after a lapse of many years, I also felt well repaid by the very interesting and efficient plant which he runs. From the time the cocoa beans from Caracas or Accra or Trinidad or Bahia arrive, until the finished packages are physically delivered to the truck man, Brick almost literally has a finger in the chocolate. If the operator of the complicated molding, filling, and cooling apparatus is absent, Brick appears in person as machine tender. When the operator returns, he blends some more chocolate, hires and fires a few more operators, receives new shipments, and sends out some more of the high-grade Moffat article for sale by S. S. Pierce or others of his customers. His family is doing very well now, thank you.

In the *New England News Letter* as published in September by the New England Council, appears a full-page map of New England showing air lines, present and proposed. Down in the right hand corner is the admission that it was prepared by the National Resources Board, District I, Joseph Talmadge Woodruff, consultant. Mr. Woodruff will be recognized as having appeared under various aliases as a most worthy member of the Class of 1917. His experience well fits him for work of the nature indicated by the name of the Board.

The New England Regional Planning Commission of the National Resources Board is located in the new Federal Building in Boston and its purpose is to study and plan for the better utilization of land, water, and other natural resources in coöperation with State and local planning boards and other agencies and to secure the wisest and most economical use of public funds. It does not contemplate search for new projects but rather the best plans for necessary current government expenditure and preparation for future emergencies. Among its immediate objectives are: A ten-year program of public works, including parks, parkways, highways, and other developments; a study of transportation facilities and suggestions for their coördination; a report on the major existing and desirable land uses; a report on suggested legislation. Joe says in part: "You, perhaps, remember that it was in 1924 that I began to howl for a New England planning

program. It is rather gratifying to feel that it is now well started with the co-operation of such an outstanding Commission, under the fine leadership of Victor M. Cutter. Mr. Cutter, by the way, is one of the Corporation of M.I.T.; a Trustee of Dartmouth; former President of the United Fruit Company; Director of the New England Tel. & Tel., and so on."

We have been officially informed that Frederick (Ted) Bernard has been appointed Agency Supervisor for the Boston agency of the Northwestern Mutual Life Insurance Company.

Good old Professor Locke sent an excerpt from his voluminous correspondence giving a partial answer to the frequent question in our minds as to what becomes of our friends, the Chinese students, once they return to China. Hsi C. Wang '17, III, reports that in spite of his training in mining at M.I.T., his work in China has been in the field of communications, including railways, shipping, and airways. At the present time he is adviser and acting assistant director of the Harbor and Wharf Administrator in Tsingtao. Although his work is administrative, he has to deal with many technical points. He still has hope that some time he may get work along the lines of his profession, particularly in connection with some of the iron and steel plants in China. The companies with which he has been associated seem to have been fortunate in securing his services, because his record shows that companies which were at a low ebb when he became associated with them picked up and were in good shape when he left them. However, he modestly states that this was largely a matter of luck. He reports that H. H. Huang, of his class, is working in the import and export business with his brother, H. L. Huang at 172 Yu Yuan Road, Shanghai, China.

So many members of the Class have made inquiries about Lewis Douglas that I am including a long clipping from the *New York Herald-Tribune*, which answers many of the questions that have been raised. His career is especially interesting to us now that he has withdrawn from the New Deal group. "Lewis William Douglas, whose resignation as Director of the Budget has been accepted by President Roosevelt, was called to that post from the House of Representatives. Bankers in New York regarded his appointment as one of prospective Federal economics. He is a capable man who went into office firm in the belief that most sections of the budget, except those pertaining to debt service, could be pruned.

"Mr. Douglas was born in Bisbee, Ariz., July 2, 1894. He was graduated from Amherst College in 1916 and the next year studied metallurgy and geology at M.I.T. From college he went directly to the Army, attending the officers' training camp at Presidio, Calif., in 1917, and going overseas as second lieutenant of the 347th Field Artillery. He was in France from July, 1918, until March, 1919, advancing to the rank of first lieutenant and serving on the 91st Division Staff.

"General John J. Pershing cited him for bravery in action in the Argonne offensive and the Belgian government bestowed on him the Croix de Guerre for conspicuous courage in the Lys-Escault offensive.

"When he came to the Arizona House of Representatives for the term of 1923-25 his background was more academic than political. Returning from the War, he had joined the Amherst faculty as a history instructor in 1920, and the next year taught chemistry at the Hackley School at Tarrytown, N. Y.

"Mr. Douglas was elected to Congress in 1927 and was reelected twice. In his first term at Washington he attracted considerable attention for the able and forceful manner in which he fought for the superior rights of his state in the waters of the Colorado River which were proposed to be impounded for Boulder Dam.

"Mr. Douglas is a grandson of James Douglas, who acquired a broad scientific training at Edinburgh and Oxford, went to Canada as a lecturer at Queen's College, and moved to Arizona in the '70's to discover the Copper Queen lode at Bisbee, the richest in the world. He became known as a man who wouldn't carry a gun, and who laughed at the menace of bullets from Geronimo's men. His son, James Stuart Douglas, was known as 'Rawhide Jim.' He married Josephine Leah Williams, daughter of a superintendent of the Bisbee Queen, brought in mines all over the State of Arizona, and founded the City of Douglas.

"The retiring Director of the Budget himself engaged in mining enterprises and operated citrus ranches in Arizona after his terms at Amherst and Hackley, but his accent and his bearing are more in keeping with the college campuses of New England than with the mining camps of the West.

"He is a sandy-haired, wiry man, of pleasant manner and soft, sure speech, who once committed the sin of siding with President Hoover from the Democratic side of the House, but turned an attempted rebuff by Vice-President Garner, then Democratic minority leader, into a joke on the veteran Texan. Mr. Garner asked him a hypothetical question and inquired how he would vote on it. Mr. Douglas said, 'I don't know.' Mr. Garner demanded: 'Does the gentleman want that answer to go into the record? Does he want his constituents to understand that he doesn't know how to vote?' — 'Exactly,' Mr. Douglas retorted. 'I will say to the gentlemen that I am honest with my constituents. When I do not know about a proposition I tell them so. What they want to do about it is up to them.'

"When he was selected for the budget post, Mr. Douglas was recognized as an authority on economy and governmental reorganization. He had been chairman of the Special House Economy Committee and a member of the Committee on Appropriations. Mr. Douglas's public statements during his tenure of the White House offered the sharpest illustrations of

1917 Continued

his courageous honesty and his sincere advocacy of economy. His Congressional colleagues predicted that he had talked himself out of politics, but he was re-elected in November, 1932.

"In 1921, Mr. Douglas married Miss Peggy Zinsser, of Hastings-on-Hudson, daughter of F. G. Zinsser, scientist, and a niece of Hans Zinsser, who became widely known for his experiments in typhus. Mr. and Mrs. Douglas have three children: Stuart, Peter, and Sharman.

"He is known by his Washington colleagues as a good baseball player, having pitched on the Amherst team and for the Democrats in the House games with the Republicans. But he was better known for his bicycle on which he not only took his exercise, but pedaled to work each day, carrying it into his office to keep it out of the hands of youngsters who let the air out of the tires when he parked it in the yard of the Treasury Building."

Vesper George School of Art, Boston, Mass., views with pride the acquisition to its staff of Nelson Chase, a graduate of M.I.T. "whose work in water color and life drawings is outstanding."

Space requirements and a few other details last month prohibited our giving a sufficiently complete picture of Dexter Tutein's place in the National Recovery Administration. Fortunately, a release from the Administration has since arrived permitting a supplementary item. The Administration announced his appointment as representative of the \$1,500,000,000 retail solid fuel trade on the NRA General Code Authority, created to supervise the administration of industries coming under the basic code. He is the first industry member to be announced. "A graduate of the M.I.T., where he completed the school of chemical engineering practice, he later served with the United States Naval Reserve Force during the World War. Afterwards, he became associated with his father's firm, E. Arthur Tutein, Inc., Philadelphia, engaged in selling pig iron, coal, coke, and so on, and also as part owners of blast furnace and by-products coke plants. Later he became associated with Harris Forbes and Company, in the corporation buying department. In 1931 he became associated with the Indiana Consumers Gas and By-Products Company, Terre Haute. In 1933, and until the present, he was engaged in a financial and marketing survey for the bondholders committee of the St. Louis Gas and Coke Corporation, Granite City, Ill."

Here is a letter from A. C. Carlton that should be of special interest to any member of the class who happens to find himself in Chicago. "Last April I promised to send you some news for the 1917 class notes. So here goes. After 11 years of copper production work — three in Chile and eight in Baltimore — I joined the staff of the Chicago Museum of Science and Industry with the title of Curator of Geology and Mineral Industries. I came to Chicago in February, 1932, and have been pleasantly busy ever since in the three-fold job of, first, planning exhibits; second, persuading individuals and corpo-

rations to sponsor these exhibits; and, third, operating the installed material. The Museum was founded by Julius Rosenwald, the guiding genius behind Sears, Roebuck and Company, and has as its prototype the famous Deutsches Museum in Munich. Our institution is housed in the reconstructed Fine Arts Building of the 1893 Exposition. Eight per cent of the building is now open to the public and a large amount of material is now being stored pending the completion of the building. This material will be greatly augmented at the close of A Century of Progress as a very large part of the worthwhile exhibit material at the Fair has been donated to the Museum. Our project differs from the majority of museums in that ours is dynamic. Full-size machines are operated. When scale does not permit us to operate commercial machines, we operate scale models. The outstanding exhibit now being shown is a full-sized representation of a modern bituminous coal mine in which the visitor sees real miners, real coal, and real coal-mining machines and at the same time is given the illusions of being lowered 500 feet into the ground and of being transported from the shaft bottom to the working faces. Over half a million people visited the Museum during its first year. This, we feel, is creditable, particularly as only eight per cent of the building has been opened. Needless to say, I shall be very glad to see you or any other classmates whenever you happen to be passing through Chicago."

I expect that for the first time in a generation, 1917 notes will soon be missing from these columns because we have a written threat from the Review Offices that telephone reminders to secretaries in the Greater Boston area will hereafter be omitted. Most of the secretaries have one or two other things on their minds for a part of the month at least, so that their constituents should not be too harsh on them if they slip occasionally under the new efficiency program. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

"Convinced that financial success might reasonably be charted by the logic of repair being cheaper than replacement, particularly in these days of conservative outlays for anything, two young men in Cambridge," says the Boston *Transcript*, "have stepped into trade in a large way in a business which has only two rival set-ups in this part of the country. Their speciality is spraying metal on anything you might want metal sprayed on."

"Perhaps you have a glass knick-knack which you would fancy in a coating of tin, stainless steel, or copper. Or you might have a collection of half-ton rollers or a few thousand slightly worn spindles, if your forebears left you a textile mill, or a paper manufactory or a rubber works, or more worn shafting. Or, if you are a shipowner, you might want the radio room fireproofed by metal walls. On a more modest scale, you might lean to modernistic treatment, by metal, of the

walls of the living room." President of these metal sprayers is no other than our own G. B. Cutts. We viewed the process through the front door of their establishment (195 Broadway, Cambridge), but it looked too utterly, too, too something to be fun.

The 1934 meeting of the New England Section of that dreadful and magnificent organization known as the Society for the Promotion of Engineering Education, met on October 20 at Rhode Island State College, Kingston, and was dignified, among other things, by a discussion on electronics and communications, the topics for which were prepared by Carlton C. Tucker. Furnishing Tucker an antiphonal moral support were classmates Richard Smith and F. A. Magoun; the latter being filled with gentle melancholy that even a spasm of concentration was insufficient to scatter the intolerable dust, thick and trackless, that has buried his comprehension of electrical terms.

One occasionally comes upon a portrait, done in whispers, which at the same time shows unmistakable evidences of the cloven hoof. To this malignant and destroying category belongs the following communication from Harold Weber which only an unquenchable adherence to a deep-rooted policy of always publishing authentic documents from the brethren prevents us from consigning to the waste basket in shabby tatters: "Hear ye! Hear ye! hear ye! All those having interest in the dignity and appearance of the Class Secretary are hereby informed that Professor Drisko, Professor Wiener, and Professor Eames have reported him to the NRA for unfair competition. In short, he has grown a Van Dyke beard which, though attached by only one end, will gather dew of a summer's eve; dangle icicles in the winter; and perchance touch up some languid damsel in the spring or fall. It is with a pang of anguish that I learn from The Review Editors of their rule against pictures in the class notes, but the article on page 67 of the November Review was precipitated by the fertility of you now know whom. Plow every third hair under, Maggie!" Dr. Weber's conclusions are irrelevant and immaterial. Has he been so long away upon the Continent without hearing of that good old game for scoring whiskers? Obviously Technology professors grow Van Dykes only that the students may thus shout "Beaver!"

To the well-known forgotten man must now be added the gone-but-not-forgotten man. Anyone knowing the whereabouts of these gone-but-nots will confer a favor by informing the Secretary, who desires their addresses for the Alumni catalogue: Leo S. Blodgett, Harvey H. Brown, J. Allston Clark, H. C. Le Vine, Malcolm H. Smith, Henry C. Stephens, Robert H. Wells, Henry W. Wright. — F. A. MAGOUN, *Secretary*, Room 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1921

Once again we come to that convocation on these pages which precedes the holiday season. Your Secretaries extend to all their sincerest good wishes — health and happiness to all of you in large measures. To which we append the oft-expressed plea that, in your haste around Prosperity Corner, you won't omit a word of cheer to your Secretaries.

From the Boston *Transcript* of September 22: "Mr. and Mrs. Everett C. Wells of Providence, R. I., announce the engagement of their daughter, Winifred, to A. Royal Wood of Wellesley, the son of Mr. and Mrs. George H. Wood of Claremont, N. H. Miss Wells was graduated from Wellesley College." Our last report locates Woodie with Lybrand, Ross Bros. and Montgomery, 80 Federal Street, Boston. Best wishes from all of us.

At their recent meeting, the board of directors of the Hydraulic Press Manufacturing Company of Mount Gilead, O., elected Howard F. MacMillin as Vice-President and assistant general manager. Behold the metamorphosis of a one-time fellow journalist into an outstanding contributor to the art of hydraulic press equipment. Mack has been with the H-P-M organization since our graduation, most recently having successive charge of development and engineering and then of sales. — On behalf of the Class, we extend our sympathy to J. Rowland Hotchkiss of Montclair, N. J., on the passing of his father.

The New York *Sun* of July 31 gives an interesting account of the mountain climbing proclivities of Dr. William R. Hainsworth, director of engineering in the Electrolux Laboratory of Servel, Inc., New York. This time Hainsworth, with Max M. Strumia, head of the clinical laboratory of Bryn Mawr Hospital, had as an objective the finding of a new route up Mount Robson, the 12,972-foot peak of the Canadian Rockies in Jasper National Park. Hainsworth is a member of the American Alpine Club and has enjoyed mountain climbing as a vacation hobby ever since his early years in his native State of Washington. He has achieved fame with a record of 20 first ascents in the Canadian Rockies. Many thousands of feet of motion pictures of his journeys up snow-capped peaks and new maps of the territory he has explored are his contributions to the pleasure of us less-hardy members of the flock. Hainsworth was a duPont Fellow at the Institute following his graduation from the University of Washington and California Institute of Technology. Last year he received the annual Charles A. Monroe award for the outstanding contribution to the gas industry. He is married and lives in Larchmont, N. Y., but says he doesn't take his wife mountain climbing!

A very Merry Christmas and a mighty Happy New Year! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, South Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N. J.

1923

I have the following information from John McGrail, IX-B, explaining what he is doing in Hollywood with the Motion Picture Producers and Distributors of America, Inc., the "Will Hays organization." "I am charged with the job of enforcing the motion picture advertising code out here on the firing line; the code's purpose is of course to keep the producers, distributors, and exhibitors of the industry within the bounds of good taste in all advertising, publicity, and exploitation material. The code is not to be confused with the NRA code, nor for that matter with the production code of this organization. The latter attempts to keep the pictures clean; my work attempts to see that the merchandising of these same productions is likewise kept free from all offense." — HORATIO BOND, *Secretary*, 195 Elm Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, Room 661, 11 Broadway, New York, N. Y.

1926

The felicity of unbounded domesticity seems still to appeal to members of the class. Our basketball captain, Bill Forrester, was married to Miss Mary McClave of Grand Rapids, Mich., on Saturday, October 27. Like many another mining engineer, Bill has braved Washingtonian criticism by going into banking. He is associated with the National City Bank of New York. — On September 16, George Breck was married to Miss Caroline Fowler of Wollaston. Breck, once of Brookline, now lives in Bloomfield, N. J., where, we understand, he still disports himself at the great game of chess. — We announced last spring that Ariel Horle was engaged and we are now happy to announce his marriage. On September 22, in Bronxville, he became the husband of Miss Elizabeth Burtnett. — Our television expert, Dr. George Morton, was married to Lucy Groat of Brookline on September 15. As a local newspaper put it, his was "a romance that had its beginnings amid the test tubes and modern scientific light ray apparatus at M.I.T." His wife was graduated from Smith in 1930 and received the master's degree from the Institute in 1932. Morton holds a doctor's degree from the Institute.

Walter Crafts is with the Union Carbide and Carbon Research Laboratories, Niagara Falls. — Cyril D. Smith evidently has returned from his sojourn in England, for we are in receipt of a report that he is back with the research laboratory of the American Brass Company, Waterbury, Conn. — J. RHYNE KILLIAN, Jr., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

1927

Thanks to an efficient clipping service, we can report continued progress for certain boys of 1927, although our report in some instances, to say the least, is a bit late. Al Beattie, whose engagement was brought to you in the October issue,

certainly had the jump on us, for the Boston *Herald*, and which, by the way, was received only a month or so past, tells of the wedding of Miss Louise Cutler Stuart to our congenial friend, Al, on August 18. We note that the newlyweds will live in White Plains, N. Y., indicating a change for Al from his old job as warehouse superintendent for the A & P Company in Boston. — On the same day, in Winthrop, Mass., Miss Louise Frances Clark and George Studley were made as one. They will live in Buffalo. Sorry we have no further information regarding George's activities in Buffalo. — The final wedding to report at this sitting concerns Earl Payne, who was married on July 28 to Miss Marjorie Stead of North Dighton, Mass., in Charlotte, N. C., where Earl is doing "engineering work." We must take the word of the Boston *Globe* insofar as the activities of Earl are concerned.

We hear that Phil Darling is in Texas City, Texas, where he is in charge of the instrument department of the "largest, newest, and most modern oil-refining unit in the world." — On a recent trip into New Jersey, your Assistant Secretary saw Don Spitzli at his Congoleum Nairn Research Headquarters. Previous and unbreakable domestic entanglements prevented our lunching together, but we were able to learn that Don's new son is Don, Jr., and that he is a very important cog in the Spitzli family.

It is hard, yet easy, to realize that when you read this it will be early December which means, in New England at least, snow, ice, cold, and the like, of use only to Ray Leonard, the champion of Pittsburgh Coal in this section and to that new breed known as ski addicts; and even though your Assistant Secretary would choose the 4th of July as the time for spreading good cheer, we are glad to wish you all of 1927 a very Merry Christmas and a Successful New Year. — JOHN D. CRAWFORD, *General Secretary*, General Radio Company, Cambridge, Mass. RAYMOND HIBBERT, *Assistant Secretary*, 238 Main Street, Room 101, Cambridge, Mass.

1928

Saturday, the 13th of October, was the big day for Al Dempewolf. On that occasion he was married to Miss Ruth Igou of New York City. This new couple will be at home after the third of November at 230 East 48th Street, New York City. We extend our sincere congratulations and very best wishes.

Mr. and Mrs. Donald Stewart Frazer have just announced the birth of Master Donald Stewart Frazer, Jr. This young man made his appearance on October 9, 1934, at which time he tipped the scales at seven and one quarter pounds. Our congratulations to Don, senior, Mrs. Frazer, and Don, junior. The 1928 family is growing fast. Don sums up the news in the following verbose fashion: "Everything is fine here in Philadelphia."

We also have the pleasure to announce the arrival of another bouncing, rosy-cheeked young man with a very impres-

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sive name; namely, Christopher Case Smith, son of Mr. and Mrs. Dudley Smith. The younger Mr. Smith was born on July 22, at which time he weighed nine pounds. Our warmest congratulations to the proud parents and also to Chris Case, who now becomes an uncle. If the young man ever goes to the Institute, he will have quite a job to match the scholastic record of his namesake.

Mrs. William L. Hayden of Augusta, Maine, has recently announced the engagement of her daughter, Lois Marcia, to Edward Birkenwald. Miss Hayden is a graduate of the College of Practical Arts and Letters at Boston University. She is secretary to Chief Justice William R. Pattangall of the Maine Supreme Court, and while in his office she studied law and was admitted to practice in 1930. Ed was formerly assistant to the bridge engineer of the Maine Central Railroad, and is now connected with the Depositors Trust Company of Augusta, Maine.

In thumbing through a recent copy of *Popular Science Monthly*, we came across the photograph of Miss Roberta Lovely, who in addition to her outstanding work in the field of biology is distinguished by the fact that she is one of the few co-eds in the Class of 1928. Miss Lovely is now a bacteriologist in the Public Health Department at Montclair, N. J. The picture in *Popular Science Monthly* showed Miss Lovely holding a shallow glass dish, upon which was displayed a living American flag. This flag was made by incubating different strains of bacteria on a culture plate, a selection of the strains so chosen to give the correct colors. — GEORGE I. CHATFIELD, *General Secretary*, 5 Alben Street, Winchester, Mass.

1929

It is with deep sorrow that I publish the report of the passing of Laurence T. Tufts, X, on September 28. Larry had not been well for some time and had been given a leave of absence at Eastman Kodak, where he had been located since receiving his S.M. in 1930. He was well on his way toward recovery and had looked forward to resuming work this fall. However, an entirely unexpected attack occurred and he lived only a few days. Larry had been active as Course X Secretary prior to his illness and we will miss him in more ways than many will realize. Ken Scott, X, reported that John Trahey, X, attended the funeral, but did not know of any others of the Class who might have been in attendance.

Frank B. Stratton, V, is to be congratulated on his appointment as instructor of music at the Massachusetts State College at Amherst. After his graduation from the Institute, Frank worked for Eastman Kodak in Rochester. While there, he became interested in the musical training at the Eastman School of Music at the University of Rochester as a means of furthering his talent. He deserted industry and after a period of study in Rochester received his degree of master of music.

The following classmates are to be congratulated on the announcement of their engagements: Bill King, III, to Carolyn Elizabeth Hanmer of Massena, N. Y. The news clipping placed Bill in Buffalo, N. Y. — Thomas W. McCue to Mary Chester Guild of Boston. — A wedding of interest to many of his classmates was that of Phil Lamb, XV₂, to Alma Frances Scott of Easton, Pa., on August 4. Phil's best man was Romeo Guest, IV-A. Phil will reside in Easton, Pa. — Another marriage of which we have heard is that of Charles A. Whitney, III. We have none of the details, but Professor Locke supplies the further information that C. A. has been operating the Wagner mine on Mineral Hill, Cripple Creek, Colo., for the North American Mines, Inc., but has now closed down the property. We extend our best wishes to these newlyweds and welcome them to the rapidly increasing group of married men.

Ken Scott, X, wrote also that he owes me an account of his wanderings since 1929. Hope that he crashes through and that that will serve as a hint to numerous others, for we could use the news. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

COURSE VI-A

After years of slow accumulation, VI-A has again sufficient news to make reporting worth while. First of all, we're very proud of our excellent turnout at the reunion. Eight of us were present: Windy Bearce, Harry Dickinson, Renato Fracassi, Ed Gardner, Joe Green, George Meyers, George McKenna, and myself. Needless to say we had a joyous time renewing friendships and comparing notes. Since most of us didn't arrive in Winchendon until Sunday, our activities were confined to that day. Impromptu tennis during the forenoon, dinner at a slow pace, and then a rocking chair get-together until departure. Not even the downpour which accompanied us on our departure was able to depress our good spirits.

During dinner we recited such information as we had (about the class and its members) for everybody's enlightenment. It, with a very few letters which I have received, makes up the source of the following.

At the time of the reunion, Windy Bearce was vacationing in Maine and was incidentally looking around for a job. A letter from him very recently offers the good news that he has found the job. His job is that of "industrial engineer" (the quotes are his) with the Central Maine Power Companies. At present he's located in Lewiston, Maine, and can be reached at the Androscoggin Electric Company. In his letter he says: "And if any of the gang gets down this way tell them to look me up through the company or at East Poland, directions at the Post Office!"

In answering a letter of mine asking him whether he would be present at the reunion, Ken Beardsley, though regretting that he couldn't be present, promised to attend the 50th. We're going

to hold him to that. Ken is in Pittsfield, Mass. (71 Ontario Street), working in the laboratory of the General Electric there. More about him at some future date.

Harry Dickinson reported continuous service with the Okonite Cable Company in Passaic, N. J. I'm expecting a letter from Harry very soon telling more about himself. Incidentally Harry was driving a new Plymouth. — The American Tel. & Tel. gang in New York was represented by Fracassi. Renato is in the research department. He reported that all was well with Dex Osgood, Owen Garfield, and Ed Perkins, the remainder of the gang.

Joe Green provided the surprise element at the reunion. He sort of disappeared after graduation. Joe is now working in Dorchester, Mass. I'm expecting a letter from him soon, too. — George McKenna reported progress. He is now managing a New England Telephone Company office. To reach George, write to 3 Thomas Street, Belmont, Mass., or 'phone Geneva 9950. — The three of us who are with the General Electric Company made up the remainder of the group at the reunion. George Meyers is with the lighting department in Lynn, Mass., Ed Gardner with the manufacturing department in Lynn, and I am with the air conditioning department in Schenectady. Ed was moved to Lynn early this year, and I was transferred to my present job about two months ago. — SAMUEL J. LEVINE, *Secretary*, 353 Glen Avenue, Scotia, N. Y.

1930

The first appeal for news has produced encouraging results. For the first time in many moons we have actually received a communication from a Course Secretary. We hope that the others will follow the good example set by Dick, and will send in news of the doings and whereabouts of their Course and classmates. In addition to this I received a note from Johnny Guinan of Course II who is now located at 295 Garfield Place, Brooklyn, N. Y. His letter is so full of news that I am passing it along as received:

"I have before me the announcement of the marriage at Manchester, N. H., on September 27 of Amerst Edward Huson to Miss Margaret Adelaide Weber. Ed has been living with me since August, 1932, and will be at home at this address after October 6. He is still with the Chase National Bank.

"I am still attached to the Mechanical Engineering Department of the Brooklyn Edison Company. We are at present engaged in collaboration with the auditor in making an inventory of the investment in fixed capital of this company. — Dr. Joe Harrington is sticking to his lasts with United Shoe at Beverly while we understand that Gus Klumpp is improving the output of the Youngstown Sheet and Tube Company at Youngstown, Ohio. I had a very pleasant visit with the Harringtons in Wenham in July."

While in New York the first part of October to attend the National Metals Exposition I ran into Sticky Tarr. He is

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still working for the Brooklyn Union Gas Company. He is in the Industrial Division of that Company. I had lunch one day with Charlie Flint who is still in the Engineering Department of the New York Telephone Company. Charlie, who is, of course, the proud father of a year-old daughter is now living in Staten Island, but works in the main office of the New York Telephone Company on West Avenue of New York City.

I was invited to the wedding of Wallie McDowell, which took place in Binghamton, N. Y., on September 15, but was unable to attend because of a business trip through the Middle West at the time. I gather, however, that the function was somewhat of a Technology reunion, since Jack Bennett, Ted Reihl, and Phil Holt were all out of town when I called in Akron the day before the wedding. Mrs. McDowell was formerly Miss Louise Horton Smith. We understand that Wallie and his wife will live in Binghamton, where Wallie is employed by the International Machine Company.

In addition to these bits of gossip and information gathered more or less firsthand we have received word of the following doings: The Sunday Post of Boston carries a series of articles on Forensic Chemistry based on information supplied by Edwin V. Hill. From the introduction to these articles we learn that since graduation Edwin has been working at Tufts College in the Chemical Department, has given a course on Crime Detection and Forensic Chemistry at Technology under the auspices of the State University Extension, and with Dr. Reis, Head of the Department of Chemistry at Tufts Medical School, has been cooperating with New England Police in the detection of crime.

The engagement of Robert Crowell to Miss Marjorie Wiehl of Glen Ridge, N. J., was announced last June, but has only recently come to our attention. — The marriage of Garret Edward Green to Miss Mary Barbara Nicoll of Great Barrington, Mass., took place on September 15. Dwight T. Hathaway, Joseph Westell, and Lawrence Barnard were ushers at the ceremony. Garret is now working for the Federal Ship Building and Dry Dock Company of Kearny, N. J. — The engagement of Allan John McLennan to Miss Ruth Deadman was announced last spring. We understand that Allan is now connected with the Shell Oil Company of Montreal. — MORELL MAREAN, *General Secretary*, 2815 Harrison Avenue, Wilmington, Del.

COURSE I

Millions of years — thousands of — hundr — a long time ago, there was a grope — er gripe — group of men known as Course I, or swivel, ah er, civil engravers — engineers. But they all went away to the core forners — fourwarners — four corners of the earth, and nobody ever heard from them again. But one way — day, their kale-marrier — mail carrier — bought, er brought coastguards — postcards — from their hermit Secretary, proving that he was not a redhead —

deadhead — dead yet. He sent out 45 missives, and five andrewsers — drew answers — another five couldn't beach 'em — teach 'em — reach 'em because of long dresses — er wrong addresses — and were burned, or returned. Thus 35 got bare — where — there, but the Lost Battalion, bruised and torn — true to form — were not heard from again. So the Suckertery pounded his typewriter — she didn't mind, she liked — anyway, he fanned — panned — scanned the five replies and burned — spurned — learned!

Jim Muir had a lot to say; I'll give you the news in his own words: "I am still working in the asphalt sales department of the Shell Petroleum Corporation, St. Louis, Mo. I have spent most of my time since the first of the year in Texas, largely in the vicinity of San Antonio, a delightful spot. One of our products was used in the construction of new runways, roadways, and so on, at Kelly Field and I was busy with that large job for several months. I have made several trips to New Orleans and vicinity, where I worked most of last year. I just missed the Mardi Gras there by a week, having to return to Texas. Early in June I took a six-week trip on business which carried me to Dallas, Tulsa, St. Louis, Detroit, Chicago, Omaha, Amarillo, and finally back to San Antonio. It was all by automobile, and some hard traveling. . . .

"I visited Bill Howard in St. Louis. He works for Shell, too, in the sales promotional advertising department. We had a right good time together. I also stopped off in Chicago for a week-end and took in as much of the Fair as possible, managing to register at the M.I.T. booth. I have seen Claude Horton, who was at summer camp with us, several times. He is working for the Dexter Construction Company, highway contractors, here in Texas. I haven't been able to catch up with his brother Dwight, yet, but hope to do so one of these days. Dwight is working for the Uvalde Construction Company, also large contractors here in Texas. It has been quite a treat for a N. E. Yankee to spend two successive winters in the balmy South — the first in New Orleans, the second in San Antonio — and I sometimes wonder if I could ever again weather a stiff northern winter. I can understand now why Fred Ricks and Bob Miller used to sleep under eight blankets and every coat in the house. Right now I'm stripped down for comfort while undoubtedly the cool breezes have started or will soon start up North. I am a homeless wanderer, but as far as I know I will continue to have temporary headquarters at the Plaza Hotel in San Antonio. Should any of the boys be down this way, it would be a pleasure to see them again and to show them the highways and byways of the Alamo City." Many thanks, Jim. I'm sure that if some of the Lost Battalion would write a letter like that once in a while, we would begin to get a little life into '30, I. Jim's "most permanent" address is: Care of Shell Petroleum Corporation, Asphalt Sales Department, Shell Building, St. Louis, Mo.

Howie Reed is with the Permutit Company in New York City and is living in Bloomfield, N. J. He gives us some news of some of the boys who are located in the Metropolitan area. He tells us: "Joe Rehler, Harry Beohner, and yours truly are still holding forth in their original jobs (with Permutit). We are fast becoming experts in the water treatment field. Beohner maintains his home in Forest Hills, L. I. You undoubtedly know that Joe has been married for almost four years, and lives in the Bronx. He has become a victim of the golf craze and can be found almost any week-end searching for golf balls which in some mysterious way have wandered off the fairway. He has to keep right after his game, otherwise his wife, who is also an addict, would lick him all the time instead of most of the time. Bill Eaton was in the office a few days ago. Bill has traveled around the country considerably since we all lived together in Jackson Heights, and he has worked for various branches of the Government, but every time he gets ready to settle down they decide to start something new. He has some good stories covering his experiences. (How about putting some of them down on paper, Bill, so we can all enjoy them?)

"I understand that Lefty Engler is here in the wilds of New York some place and that he is teaching at C. C. N. Y. I get a Christmas card from Joe Westell each year but haven't the slightest idea what he is doing with himself. This is about all the news I can send you. If any of the fellows are in the vicinity of New York and will call us up, we would appreciate the opportunity of swapping stories. My name is in the Bloomfield telephone book and if anyone is looking for a place to spend the night, I'll be glad to see them." Howie's address is: 153 Franklin Street, Bloomfield, N. J.

Harry Beohner has not accounted for himself, but, just to show the rest of you how our ears pick up whisperings, we have the lowdown on him. Get this: He is living in Forest Hills with some R. P. I. men; not only that, but he makes frequent trips to Massachusetts not on company business; he receives a letter every day addressed in feminine handwriting, and his eyes have that far-off look at times. Let that be a lesson to the rest of youse guys — and let Harry tell us what else he is doing.

There is more news, but I'm going to save it for the next number. I have some news from Art England, Chuck Habley, and Brownie Taylor to pass on to you. Instead, I'll tell what I've been up to. In the fall of 1932 the construction job that I was on in Oregon was completed and I found myself looking around for more of the same, but with the usual story. I spent the winter in Washington, D. C., with my parents, and came back to Chicago in the spring of 1933 in time to land a job at the Fair. It was a temporary clerical position in the administration, but I had time to get to see every corner and fan at the exposition. Then when the end drew near, I began to look

1930 Continued

again. This time I didn't have to look such a long time. I am in the engineering department of Columbia Broadcasting System's station WBBM in Chicago. Though the job of studio engineer is a rather far cry from Course I, Option 3, I like the work and the business very much. I have been with them about a year, and if business keeps up in radio the way it is going at present, there should be little chance of any layoffs. Traffic is the heaviest in the history of the company. That's good news, and I'm sure many of you have something just as easy to write, as the rest of us have found after once breaking the ice. So out with it and in with it! — RICHARD N. CHINDBLOM, *Secretary*, 916 Judson Avenue, Evanston, Ill.

1933

The information exchange has had a weak month since the last issue. Johnny Longley sends a postscript to his notes of last month to the effect that Ben Hiatt was married to Miss Margaret Mary Smith of Lansdowne, Pa., on Monday, September 24. They are making their home at 16 East Ridge Road, Rochester, N. Y. May I extend the congratulations of the Class to you, Ben, and lots of good luck. — A business letter I recently received at the office with Doug Penning's name on the bottom speaks well for his doings with the Titusville Iron Works of Titusville, Pa. I am after more details and will pass on the news when I get it. Let's hear more from you fellows who are a ways from our center at Boston and tell us how things are where you are. — GEORGE HENNING, JR., *General Secretary*, 163 Barbey Street, Brooklyn, N. Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-106, M.I.T., Cambridge, Mass.

COURSE VI

The summer has passed and June gone by, which marks the first anniversary of our graduation. Time marches on and so do members of our course and class.

We have a number of our members reaching new heights, attaining new goals which we are all glad to hear of. Through the march of time and life it will be interesting to discuss our life work and our part in making history for VI '33 — when time is about to close upon us.

I can imagine fellows like McCormack bending (with a 90° angle in his back) over some old, worn table, hunting with a fiendish gusto to find out how a vacuum can be created in a 40 watt lamp without a tip on it. I am told by his partner that one of the greatest mistakes Sylvania Tube Company made was when they hired Bob McCormack.

Talking about new goals, here is what Joe Blanchard has to say in his letter: "As yet I am still single, but before long I shall be taking the big step myself. When I do, I'll plan to let you know." Just as soon as he lets me know I'll pass on the good word. Good luck, Joe, we'll be rooting for you. Since January Joe has been working for the Anderson Manufacturing Company in Cambridge just around the corner from Dorms. The

company manufactures steel spring covers, vacuum radiator air valves for house cleaning.

Ye all know the pompous Greek. In other words, Leon Keyolos, whom we left behind for half a term for Leo preferred working. He finally got through — degree and all — and is now working on a farm in Pennsylvania. About October Leo expects to sail for Greece, where he got a job teaching for a year. I'll probably tell you more about it after I see him in New York.

Manchester Airport, Goffs Falls, N. H., is where you will find Bob Swain dispatching planes for the B. & M. It's another of the many varied jobs he has had since graduation, a total of five. I believe he surpasses my record. When not dispatching, he is designing a transmitting station for the company.

Dick Faldette is now a salesman in Cambridge, selling the Cardvertiser, a machine to message postcards and address them, with little luck so far.

John Logan is working as a draftsman for the Jersey Central Power and Light — started April 1. We have the good fortune of having a man in our course that has had so many jobs since graduation that I have lost count. We find his name in the newspaper associated with a surveying group in Manchester, N. H. To his great surprise, he ran into Bob Swain who is working on the grounds to be surveyed, imagine the gossip (yes, Bob Baker).

Al Payne is getting along very well in his printing press job. Al is being elevated gradually, Tech is to blame he says. — Bruce Ennis, you're a great guy, a great and beloved living example of some of the grand qualities Course VI men are composed of; a brilliant engineer and a martyr to his profession; mocking at all beckoned jobs in order that he may remain in the electrical profession. Great guns, and stick to them.

Boys, make your collections now, Charley Quick got another increase in wages. A new location, but with the same company (Detroit Edison) and a brand new Ford V8, thrown in with the increase for good service rendered.

I regret to say that this article is late for publication in the issue intended by our class secretary. Business of Goodridge Engineering Company has been on a rampage the last few weeks and time was at a premium. A short spurt of business had started but is subsiding now; however, I'm optimistic for the coming winter's business.

Those of you who have visited the electrical show in New York City may have seen two electrical displays I have built. One is called the "mysterious revolving ball," the other, "fireworks." Both principles have been demonstrated in physics lecture (remember Professor Page?). I'm intending to develop these others suitable for window displays.

Time marches on and I'm falling behind, so good luck and success to all of you, until I catch up to wish you even greater luck and happiness. — EDWARD S. GOODRIDGE, *Secretary*, 55 Hanson Place, Brooklyn, N. Y.

THE TECHNOLOGY REVIEW

COURSE XV

Our list of "family men" is gradually increasing. Walt Duncan joined the ranks in September. Congratulations, Walt. Walt, by the way, is still with P. & G. in Cincinnati. Wonder who will be the next to take the plunge?

Now let's see what we know about some of the rest. Bob Ripin had a very profitable summer day camp but I do not know what he is doing now. Art Hungerford is still with NBC. I hear Dave Lee has left Macy's and is with Chrysler in a select training group. Webster is with Canada Dry in Boston. Mal Mayer is working on a production control system at American Tube Works in Somerville. Pearson, after having one grand time on the European trip this year, is located with Palmolive-Peet in Jersey City. His address at present is at the "Y" on Bugen Avenue. He is quite enthusiastic about his work, cost accounting, and plans to continue in it at N. Y. U.

Littman stopped down in Boston on his way around the country visiting plants. Sammy Baum is with Truscon in Youngstown. Dick Robinson is with his father. Win Adams is in Providence; he is engaged. Bill Barkley was at a theological school. Art Esslinger went to Europe and has a job with McCann-Erickson Advertising Agency in New York.

Jack Andrews is in the purchasing department of the Eagle Pencil Company in New York. Ken Mosslander is with American Chicle. Ace Jewell is with a brokerage house. Bill Miller is a regular C.E. and is Assistant City Engineer in Scranton and William C., the Third, is doing nicely. Jack Farmer was kicked by a mare and suffered a cracked shin bone. Ed Lloyd is doing air conditioning work with the Washington Gas Light Company. He was out this way this summer to see the Fair and stopped for a few days. — FRANK J. LOPKER, *Secretary*, 1118 State Street, St. Joseph, Mich.

COURSE XVII

There is news from a lot of the fellows this month: Jim Norcross has married, Coop Cotton has prospects of spending about three million dollars after the first of the year, and all six from whom we have a report just now are working.

Jim reported on the post card reply that he is married, Bob Crane notes that the same has happened, and Coop writes about it, too. In fact, Bob said that he saw Jim at home and washing dishes. We haven't found out who the young lady is yet, but perhaps next time he'll tell us her name and all the details. He's still with C. W. Whittier and Brothers at Boston, and now he's rent collection supervisor and likes it. Things seem to be looking up for Jim. Here's luck, Jim, and best wishes.

And would you believe it? Coop is working at an insane asylum. Without a doubt he now holds the record for queer things done. His report for the gang says that he is superintendent of construction at the Missouri State Hospital for Insane

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doing fireproofing work with a force of six sane whites and about ten feeble-minded negroes. That's one thing Professor Tucker didn't discuss in his 17.50 course. But to go ahead with Cotton's work: He's working on buildings some 80 years old with solid brick walls and partitions. He's tearing out the old floors and putting in junior beams and a two-and-a-half-inch slab. As he describes it: "At present the work is very slow as the money is limited and the crew is composed of six sane men, regular employees of the institute, and about ten feeble-minded negroes; so you can imagine what I have to work with outside of all the problems of the old buildings. One of the niggers asked me what my work was and I told him I was an engineer, and immediately he asked me what train I ran. Maybe you think I didn't feel something or other."

Though the repair and remodeling work goes slowly just at present, Coop has prospects of something much better. At the first of the year the eleemosynary institutions will get 13 million dollars to spend on remodeling and new buildings, and about three million will go to the State Hospital. The chances look pretty bright for our Cooper.

The Colonel writes to say that he has a new address — 40 Peterboro Street, Boston. Since we don't know when, Cornell has been selling siding and roofing for the Dix Lumber Company, and while he likes it, he's willing for a change. The Colonel says he saw Warren recently and that he's working with Professor Voss in the lab at the Institute. We'll have to have a report from Warren next month.

"Chief of Party and Assistant Engineer in Charge of Job." How'd you like that for a title? Well, that's Tom's now, and no fooling. He's still with the City of Haverhill (Mass.) on the Emergency Relief Administration work, and checks the blanks "contractor" and "engineer" as his occupation — bet he's pretty busy doing all that. While things aren't looking down for Galvin, he doesn't think they are looking up either, and so makes a cross between the two end conditions.

Sully, the old scooper, doesn't answer his mail, if it went to the right place, but we have a little line on him anyhow. To be more definite, Bob is selling and likes it. Things are looking straight ahead — you decide what that means. His parting shot is, "Brother, can you spare a dime?" — How about it, can you?

I'm still in the office of Southeastern, getting a dose of the figuring end. It's pleasant work and things are coming along all right. Just like Bob, we do anything — have figured a jail mess hall, a mill, a hospital, radio guy anchors, and several schools. The PWA work is practically the only construction being started in this section now . . . and the mill we figured the middle of October was the first one to come to our office in over 16 months. To answer the questions: "Doing fair, got a job, working as general handy man, I like it, things are looking

up, not married, no children, weather good, have seen no one. Misc. Items: Drop me a line again, I'll answer it, honest!" — BEAUMERT WHITTON, *Secretary*, Southeastern Construction Company, Box 1491, Charlotte, N. C.

1934

Big things happened in New York on the evening of October 18, when some 27 members of our class gathered at the Technology Club for an informal dinner and get-together. Tuffy Emery, who is a member of the Club, made all the arrangements. He sent notices to 80 fellows, whose names he got from a list furnished by the Alumni Association. The reunion was a huge success, and as far as I could ascertain, a good time was had by all.

James A. Burbank '16, President of the Club, gave the boys a short talk, in which he mentioned the importance of the Club as the headquarters of Tech in New York. He also mentioned the fact that in the last year 50 men were placed through the Club's efforts, sighting his own job as an example. Mr. Burbank invited us to make the Club our regular meeting place, and asked those of us who played contract bridge to stay and make up tables for their tournament which started that evening.

Among those present, here is what some of them are doing. King Crosby reported that he has not been idle since graduation. He worked during the summer as counsellor at a boys' camp on Cape Cod, and during the month of September he was chemical laboratory assistant at the die-casting division of the Aluminum Company of America, in Garwood, N. J. Later he became associated with the Reynolds Metal Company at Glendale, Long Island, N. Y., where he is working on various foil-rolling mills. He expects to be transferred in the future, probably going to Louisville, Ky.

George Struck certainly made a strike when he landed a job with the Powers X-Ray Products. George is in charge of a rapid X-Ray survey for the detection of tuberculosis. At present his work is keeping him on Long Island, where he is examining school children of all ages (even college boys . . . and girls) for symptoms of T. B. Starting on December 1, he will be in California, where a similar survey lasting for a period of two years is to be made. Charlie Parker, who graduated last February, and who immediately ran off to get married, is with the American Iron and Steel Institute. "It just can't be put down on paper; it's too complicated," says Charlie in speaking about his work. It has something to do with Code Authority work on technical details of steel sales, of which he is supposed to be an authority, but he adds that "it's a fake." Larry Stein is taking inventory for the Westchester Lighting Company. Says he spent most of the summer up on a steel structure counting holes, nuts, and bolts, and knows all about them. Another expert is Bob Ghelardi, this time in paper research. He is with the American Sealcone Company,

in Brooklyn. Bob has all the airs of the expert, what with him smoking Marlboro cigarettes, et al.

Art Esslinger is being taught the advertising business, and his employers, McCann-Erickson, Inc., are trying to find out if Art knows a good sign from a bad one. So they are using Art to go around pulling down billboards that are unattractive or those which people care nothing about. Ed Asch, as some of you may know, lives in Freeport, Long Island. Surely you remember Ed's love of travel. And those of you who know Long Island and New Jersey must recall that Freeport is some 40 miles from Belleville, N. J. Anyway, what I'm trying to say is that Ed is with the Overman Cushion Tire Company, and he commutes daily. Forty miles in one stretch isn't bad at all, but Ed starts from home by the Long Island R. R. In New York he takes a subway to the tunnel, and from there a bus to his work. And the work, well Ed claims that he is still able to put in a good eight hours doing factory production work, which consists generally of design, planning, and scheduling; also study of causes of failure and smatterings of sales and marketing. Dean Dadakis is another of the boys learning a business by starting from the bottom. The Oxyweld Acetylene Company has Dean bumping all the time by rushing him from one department to another.

Two representatives of Course XIII were present. Doug MacMillan is doing engineering, drafting, and estimating for the Federal Shipbuilding Corporation. Bob Moody, who just recently arrived from Cleveland, is now in the Purchasing Department of the General Motors Export Company.

There are many more, but I haven't room to tell you about them now. Enough to mention their names for the time being: Sam Joroff, Wally Buttmi, Ivar Malmstrom, George Bull, John Hawkins, Ed Sieminski, Fred Judd, Shorty Stoller, Ed Geitmann, and Bob Roulston. They were all at the dinner, and I got some dope from each of them, but it will have to wait until next month.

Now for another big story. Bill Ball, who is taking a training course (with salary) with the Gulf Refining Company, answered my request for a story about the tour of Europe that was made by 24 fellows last summer. Seventeen were Tech men, and those in our class include Bill himself, Tom Burton, Mort Hansen, Johnny Callan, Ed Geitmann, Art Esslinger, John McLean, Phil Walker, and Les Doten. The entire trip was made in Thorne-Loomis trucks and covered a period of nine weeks. In touring England, the boys came through the Devon country (which Bill describes as one of the prettiest parts of the British Isles); they visited Stratford-on-Avon, Oxford University, Slough's Industrial Center, and London. In Holland the boys were puzzled by the traffic regulations. A one-way street is plainly marked by a sign which reads "gjtphul stroog", so what? Some of the other highlights of the trip included a visit to the Hoffbrau

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House in Munich, the world's most famous beer garden, and a visit to Oberammergau for the Passion Play. They crossed the Alps with the trucks, and after visiting the Peace Buildings in Geneva, continued on to Paris, and then home. From what I gather, the boys had quite the time in Munich, where they met some 20 Smith girls — also touring Europe.

Some definite information concerning Dick Bell reached me last month just late enough so that I was unable to include it in the notes for the November issue. Dick writes that he is an assistant foreman of some clay stripping operations. He is in charge of a fleet of trucks and two gasoline shovels, and has a gang of 30 men under him. The work, he says, is hard, and he is on the job from 5:30 A.M. until 6:00 P.M., so that most of his off-time is spent in bed. Dick is living in Gleason, Tenn., a town that he describes as a "wide place in the road with a population of about 400."

On one occasion Dick had to move one of his gasoline shovels from one clay pit to another, a distance of about eight miles. A local resident developed a feeling of antagonism against the shovel, and threatened to knife Dick if he ordered the operator to leave it in the vicinity of the man's house for the night. After a conference involving a lot of talk on the part of the local resident, the shovel was left as desired, but during the following week Dick was stalked as he went to and from work and, as he had rather a close call one day, he finally decided to tote a gun until the gentleman had cooled down.

Another member of the class who was married during the summer is Ted Stack-

pole. Don't ask me who the girl is, because I have a hard time even in finding out who of you are getting married. Oh, I did find out Mrs. Edward Bromley's maiden name; it is Ruth Hancock. There are two fellows who were married even while we were mere undergrads, and I guess there is no harm in letting everyone in on it now, although my guess also is that there were few who were unaware of it. Mel Sousa was married early in the summer after our second year at Tech, and Mrs. Sousa presented him with little Arnold along around March, 1933. Erk Kelly has been married, God knows how long, and also has a little boy, about two years old, I should say, but being a poor judge of children, don't take my word for it.

Besides Mel, Erk, and George Struck (whom I mentioned earlier in these notes), the only other Course XVI man of whom I have heard is Franny Doyle. He is taking his studies seriously at Alameda, Calif., where he is on a fellowship given by the Boeing School of Aeronautics.

Harry Eagan and Hal Thayer are both with the Calco Chemical Company at Bound Brook, N. J., and are living together in Somerville. Neither of them were at the dinner in New York, but I heard today that they were trying to get in touch with me in order to find out where it was to have been held. Johnny Carey, I learned recently, accompanied Murphy and that gang to Panama, and as far as I know, is working along with them.

George Bull spent some time at Fort Totten during the past summer doing O.R.C. work, and is proud to report that he passed all his sub-courses toward

a commission of 1st Lieutenant and most of them toward a Captaincy. All he has to do now is to wait nine years for an appointment. George is employed by the Standard Oil Company of New York, doing routine analyst work. George Priggen, another XV man, is there also.

The peace and quiet of New York was shattered this morning (this being October 19), and by nothing more than the arrival of one Colonel G. L. (Goofy to you) Way, that emissary from Washington who drives a new yellow and black Studebaker. He called me while he was having breakfast (at the remarkably early hour of one in the afternoon), and requested me to come see him before he left town. Goofy's left leg, the one he broke playing lacrosse, is not quite well, and he sports a cane. I asked him what the official title of his position is, and here is the answer I got: Assistant Chief of Projects, C.W.A., F6, B.A.E., U.S.-D.A. (Mr. Roosevelt would be extremely pleased to decipher all that for you. Merely address your letters to F. D. R., D. C.). Goofy said he had heard from Manny Sayles (the Cornhusker from Omaha). Manny is playing Friday for the Chief Engineer of an Omaha air-conditioning company.

And that concludes my ramblings for another month. I should appreciate letters from those of you who have some news of fellows about whom I know nothing. You can always reach me at the address given below, and if any of you are ever in New York, just drop in. — ROBERT C. BECKER, *Secretary*, 43-20 30th Avenue, Long Island City, N. Y. HOYT P. STEELE, *Assistant Secretary*, 27 Beechwood Street, Quincy, Mass.

THE REVIEW FORGES AHEAD!

Circulation is mounting and almost every mail brings encouraging reactions from Technology men. Here are excerpts from letters recently received:

I have made it a practice to circulate my copy of The Technology Review to some of my fellow executives — not M.I.T. men — who have expressed great admiration of the contents and style of your publication.

At this time allow me to congratulate you and your associates on the splendid magazine you publish. The presentation is never dull, yet the subject matter is of vital interest to all of us.

I have been a subscriber to The Technology Review without interruption since I graduated in 1903. It is always a source of satisfaction to

me to see the high quality which is now being maintained in this publication.

Allow me to take this opportunity to compliment the editors on the splendid character of The Review. Entirely aside from its Alumni interest, I find it one of the most informative and interesting publications that comes to my attention.

... it is a delight to take up each issue as received; to obtain full measure of value, anyway you look at it.

The Review welcomes letters of comment, the brickbats along with the roses. Watch the new Department "Mail Returns" for important reader reactions.